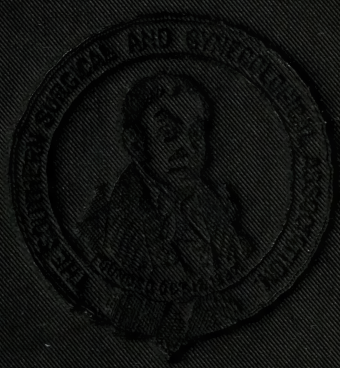

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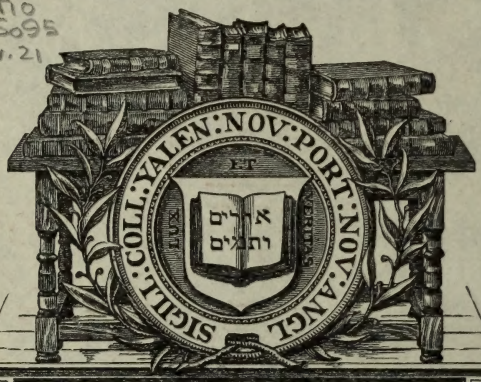

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SOUTHERN SURGICAL AND GYNECOLOGICAL ASSOCIATION

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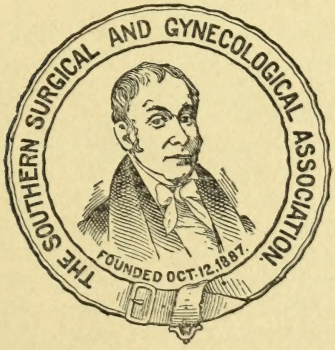
TWENTY-FIRST SESSION

HELD AT ST. LOUIS, MO.

DECEMBER 15, 16 AND 17, 1908

EDITED BY W. D. HAGGARD, M.D.



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1888.	*W. D. Haggard.	R. D. Webb. J. W. Sears.	*W. E. B. Davis.	Hardin P. Cochrane.
1889.	*Hunter H. McGuire.	W. O. Roberts. *Bedford Brown.	*W. E. B. Davis.	Hardin P. Cochrane.
1890.	*George J. Engelmann.	*Berthold E. Hadra. Duncan Eve.	*W. E. B. Davis.	Hardin P. Cochrane.
1891.	Lewis S. McMurtry.	*J. McFadden Gaston. J. T. Wilson.	*W. E. B. Davis.	Hardin P. Cochrane.
1892.	*J. McFadden Gaston.	*Cornelius Kollock. George Ben Johnston.	*W. E. B. Davis.	Hardin P. Cochrane.
1893.	*Bedford Brown.	Joseph Price. George A. Baxter.	*W. E. B. Davis.	Hardin P. Cochrane.
1894.	*Cornelius Kollock.	A. B. Miles. J. B. S. Holmes.	*W. E. B. Davis.	Hardin P. Cochrane.
1895.	Louis McLane Tiffany.	Ernest S. Lewis. Manning Simons.	*W. E. B. Davis.	*Richard Douglas.
1896.	Ernest S. Lewis.	Joseph Taber Johnson. *Richard Douglas.	*W. E. B. Davis.	*A. M. Cartledge.
1897.	George Ben Johnston.	W. E. Parker. Floyd W. McRae.	*W. E. B. Davis.	*A. M. Cartledge.
1898.	*Richard Douglas.	*H. H. Mudd. James A. Goggans.	*W. E. B. Davis.	*A. M. Cartledge.
1899.	Joseph Taber Johnson.	F. W. Parham. W. L. Robinson.	*W. E. B. Davis.	*A. M. Cartledge.
1900.	*A. M. Cartledge.	Manning Simons. W. P. Nicolson.	*W. E. B. Davis.	W. D. Haggard.
1901.	Manning Simons.	George H. Noble. L. C. Bosher.	W. D. Haggard.	Floyd W. McRae.
1902.	*W. E. B. Davis.	J. Wesley Bovée. J. W. Long.	W. D. Haggard.	Floyd W. McRae.
1903.	J. Wesley Bovée.	Christopher Tompkins. Bacon Saunders.	W. D. Haggard.	Floyd W. McRae.
1904.	Floyd W. McRae.	George S. Brown. J. Shelton Horsley.	W. D. Haggard.	Charles M. Rosser.
1905.	Lewis C. Bosher.	J. D. S. Davis. I. S. Stone.	W. D. Haggard.	Charles M. Rosser.
1906.	George H. Noble.	Stuart McGuire. E. Denegre Martin.	W. D. Haggard.	Charles M. Rosser.
1907.	Howard A. Kelly.	Rufus E. Fort. Hubert A. Royster.	W. D. Haggard.	Charles M. Rosser.
1908.	F. W. Parham.	Henry D. Fry. W. F. Westmoreland.	W. D. Haggard.	Stuart McGuire.
1909.	Stuart McGuire.	John Young Brown. R. S. Cathcart.	W. D. Haggard.	Wm. S. Goldsmith.

* Deceased.

HONORARY MEMBERS.

1894.—Foy, George,	Dublin.
1894.—Jacobs, Charles,	Brussels.
1894.—Martin, A.,	Berlin.
1902.—Maury, Richard B.,	Memphis, Tenn.
1894.—Morisani, O.,	Naples.
1894.—Pozzi, S.,	Paris.
1902.—*Reamy, Thaddeus A.,	Cincinnati, Ohio.
1907.—Tiffany, L. M.,	Baltimore, Md.

* Deceased.

MEMBERS.

* Deceased.

1908.—Abell, Irvin, M.D. Professor of Principles and Practice of Surgery and Clinical Surgery, Medical Department, University of Louisville; Visiting Surgeon, University Hospital, Louisville City Hospital, and St. Mary and Elizabeth Hospital. 1228 Second St., Louisville, Ky.

1905.—Baker, James Norment, M.D. Visiting Surgeon, St. Margaret's Hospital; Secretary of the Medical Association of the State of Alabama. 719 Madison Avenue, Montgomery, Ala.

1894.—Baldridge, Felix E., M.D. Huntsville, Ala.

1900.—Baldy, John Montgomery, M.D. Professor of Gynecology, Philadelphia Polyclinic; Surgeon to Gynecean Hospital; Consulting Surgeon to Frederick Douglass Free Hospital and to the Jewish Hospital. 2219 De Lancey Place, Philadelphia, Pa.

1903.—Balloch, Edward A., M.D. Professor of Surgery, Medical Department of Howard University; Surgeon to Freedmen's Hospital; Member American Academy of Medicine. 1013 Fifteenth Street, N. W., Washington, D. C.

1908.—Barr, Richard Alexander, M.D. Professor of Abdominal Surgery, Medical Department of Vanderbilt University; late Major of First Tennessee Infantry, U. S. A. Cor. Church and Seventh Avenue, N. Nashville, Tenn.

1905.—Barrow, David, M.D. Ex-President Kentucky State Medical Society. 148 Market Street, Lexington, Ky.

1905.—Bartlett, Willard, M.D. 4257 Washington Boulevard, St. Louis, Mo.

1904.—Batchelor, James M., M.D. House Surgeon of Charity Hospital; Associate Professor of Surgery, Tulane University. New Orleans, La.

1901.—Baughman, Greer D., M.D. Lecturer on Hygiene; Demonstrator of Pathology; Demonstrator of Physiology; in charge of Gynecological Dispensary at Medical

College of Virginia. 12 North Second Street, Richmond, Virginia.

1907.—Bevan, Arthur Dean, M.D. Professor Surgery Rush Medical College, University of Chicago. 100 State Street, Chicago, Ill.

1908.—Blair, Vilray Papin, A.M., M.D. Metropolitan Building, St. Louis, Mo.

1906.—Bloodgood, Joseph Colt, M.D. Associate Professor of Surgery, Johns Hopkins University; Associate Surgeon, Johns Hopkins Hospital; Surgeon to the Union Protestant Infirmary; Chief Surgeon to St. Agnes' Hospital. 904 North Charles Street, Baltimore Md.

1893.—Bloom, J. D., M.D. Consulting Surgeon, Touro Infirmary; Lecturer on Diseases of Children, Tulane University. New Orleans, La.

1901.—Boldt, Hermann J., M.D. Gynecologist to Post-Graduate Hospital, St. Mark's Hospital, German Polyclinic; Consulting Gynecologist to the Beth Israel Hospital and to St. Vincent's Hospital; Professor of Gynecology, Post-Graduate Medical School; Member of the Gynecological Society of Germany; Fellow of the American Gynecological Society; Fellow of the Royal Society of Medicine (London); ex-President of the New York Obstetrical Society; of the German Medical Society of New York; of the Section of Obstetrics of the New York Academy of Medicine. 29 East Sixty-first Street, New York, N. Y.

1902.—Bonifield, Charles Lybrand, M.D. Professor of Clinical Gynecology, Medical College of Ohio (Medical Department University of Cincinnati); Member American Association of Obstetricians and Gynecologists; ex-President Cincinnati Academy of Medicine; ex-President Cincinnati Obstetrical Society. 409 Broadway, Cincinnati, Ohio.

1890.—Bosher, Lewis Crenshaw, M.D. Professor of Practice of Surgery and Clinical Surgery in the Medical College of Virginia; Visiting Surgeon to the Memorial Hospital; Member of American Surgical Association; Member of the American Association of Obstetricians and Gynecologists; Member of Association of American Anatomists; Member of American Urological Association; ex-President of Richmond Academy of Medicine and Surgery. *Vice-President*, 1901; *President*, 1905. 422 East Franklin Street, Richmond, Va.

1895.—Bovée, J. Wesley, M.D. Fellow of American

Gynecological Society; President of Washington Obstetrical and Gynecological Society; ex-President Medical and Surgical Society of the District of Columbia; Honorary Fellow Medical Society of Virginia; Professor of Gynecology of George Washington University, Washington, D. C.; Gynecologist to Providence, Columbia, and George Washington University Hospitals; Consulting Physician to St. Ann's Infant Asylum, and Attending Gynecologist to St. Elizabeth's Hospital for the Insane, Washington, D. C. *Vice-President*, 1902; *President*, 1903; *Council*, 1903-1906. The Rochambeau, Washington, D. C.

1902.—Broome, G. Wiley, M.D. Consulting Surgeon, St. Louis City and Female Hospitals; Member St. Louis Medical Society. 612 N. Taylor Avenue, St. Louis, Mo.

1898.—Brown, George S., M.D. Ex-President Jefferson County Medical Society. *Vice-President*, 1804. Birmingham, Ala.

1905.—Brown, John Young, M.D. Formerly Surgeon-in-Charge, St. Louis City Hospital; President of the American Association of Obstetricians and Gynecologists, 1906. *Vice-President.* Metropolitan Building, St. Louis, Mo.

1908.—Bryan, Robert C., M.D. Professor of Descriptive Anatomy, University of Medicine, Visiting Surgeon to the Virginia Hospital. Fifth and Main Streets, Richmond, Va.

1907.—Burch, Lucius E., M.D. Professor of Gynecology, Vanderbilt University, Medical Department; Gynecologist, St. Thomas' Hospital, Nashville; Gynecologist, Nashville City Hospital; Captain and Surgeon, N. G. S. T. 150 Eighth Avenue, N., Nashville, Tenn.

1899.—Burthe, L., M.D. 124 Baronne Street, New Orleans, La.

1900.—Byford, Henry T., M.D. Professor of Gynecology and Clinical Gynecology, College of Physicians and Surgeons (University of Illinois); Professor of Gynecology, Post-Graduate Medical School of Chicago; Surgeon to Woman's Hospital, etc. 100 State Street, Chicago, Ill.

1902.—Caldwell, C. E., A.M., M.D. Professor of Principles of Surgery, Miami Medical College; Visiting Orthopedic Surgeon, Cincinnati Hospital; Member Cincinnati Academy of Medicine. 110 Cross Lane, Walnut Hills, Cincinnati, Ohio.

1906.—Cannady, John Egerton, M.D. Former Surgeon-in-Charge to Sheltering Arms Hospital, Hansford, W. Va.;

Fellow of the American Association of Obstetricians and Gynecologists; Non-resident Honorary Fellow of the Kentucky State Medical Society; Fellow of the West Virginia Medical Association, Virginia Medical Society, Tri-State Society of Virginia and the Carolinas, American Association of Railway Surgeons. Coyle and Richardson Building, Charleston, W. Va.

1904.—Carothers, Robert, M.D. Professor of Clinical Surgery, Medical College of Ohio, Medical Department Cincinnati University; Surgeon to the Good Samaritan Hospital; 413 Broadway, Cincinnati, Ohio.

1903.—Carr, William P. M.D. Professor of Physiology and Professor of Clinical Surgery, Columbian University; Surgeon to the Emergency Hospital and University Hospital; Consulting Surgeon to the Washington Asylum Hospital and the Government Hospital for the Insane, Washington, D. C. 1418 L Street, N. W., Washington, D. C.

*1891.—Cartledge, Abiah Morgan, M.D.

1899.—Cathcart, R. S., M.D. Assistant to Chair of Clinical Surgery in the Medical College of the State of South Carolina. *Vice-President.* 66 Hasell Street, Charleston, South Carolina.

1904.—Chambers, P. F., M.D. Attending Surgeon, Woman's Hospital; Consulting Surgeon, French Hospital. 49 West Fifty-seventh Street, New York, N. Y.

1907.—Clark, John G., M.D. Professor of Gynecology, University of Pennsylvania; Gynecologist-in-Chief, University Hospital. 2017 Walnut Street, Philadelphia Penna.

1907.—Clark, S. M. D., M.D. Associate Professor Gynecology, Tulane Medical Department; Visiting Surgeon, Charity Hospital. 1435 Harmony Street, New Orleans, La.

1893.—Cocram, Henry S., M.D. 124 Baronne Street, New Orleans, La.

1908.—Coffey, Robert C., M.D. Secretary Oregon State Board of Medical Examiners; Councellor Oregon State Medical Association. Portland, Oregon.

1893.—Coley, Andrew Jackson, M.D. Councillor of the Medical Association of the State of Alabama. Alexander City, Ala.

1902.—Coley, William B., M.D. Clinical Lecturer on Surgery, College of Physicians and Surgeons; Assistant Surgeon in Hospital for Ruptured and Crippled; Attending

Surgeon to General Memorial Hospital; Fellow of the American Surgical Association, New York Surgical Society, and New York Academy of Medicine. 5 Park Avenue, New York, N. Y.

1908.—Connell, F. Gregory, M.D. Associate Surgeon St. Mary's Hospital. Oshkosh, Wis.

1907.—Crawford, Walter W., M.D. Ex-President Perry County Medical Society; Ex-president Mississippi State Medical Association; Surgeon to South Mississippi Infirmary. Hattiesburg, Miss.

1902.—Crile, George W., M.D. Professor of Clinical Surgery, Medical College of Western Reserve University; Surgeon to St. Alexis' Hospital; Surgeon to Lakeside Hospital. 275 Prospect Street, Cleveland, Ohio.

1908.—Crisler, Joseph Augustus, M.D. Professor of Anatomy and Operative Surgery, College of Physicians and Surgeons, Memphis, Tennessee; Lecturer on Minor Surgery, Medical Department, University of Mississippi; ex-Member Mississippi State Board of Health and Medical Examiners; ex-Vice-President Mississippi State Medical Association and Tri-State Medical Association; Member Mississippi Medical Association. Memphis Trust Building, Memphis, Tenn.

1893.—Crofford, T. J., M.D. Professor of Physiology and Clinical Lecturer on Gynecology in the Memphis Hospital Medical College. 155 Third Street, Memphis, Tenn.

1906.—Cullen, Thomas Stephen, M.D. Associate Professor of Gynecology, Johns Hopkins University; Associate in Gynecology, Johns Hopkins Hospital; Consultant in Ab dominal Surgery, Church Home and Infirmary. Fellow of the American Gynecological Society; Honorary Member to La Societa Italiana Ostettricia Ginecologia, Rome; Corresponding Member of the Gesellschaft f. Geburtshülfe, Leipzig. 3 West Preston Street, Baltimore, Md.

Founder.—Cunningham, Russell M., M.D. Professor of Practice of Medicine and Clinical Medicine, Birmingham Medical College; Surgeon to the Pratt Mines Hospital. Ensley, Ala.

1906.—Cushing, Harvey, M.D. Associate Professor of Surgery in the Johns Hopkins University. 3 West Franklin Street, Baltimore, Md.

1907.—Danna, Joseph A., M.D. First Assistant House Surgeon, Charity Hospital. Charity Hospital, New Orleans, La.

Founder.—Davis, John D. S., M.D. Professor of Surgery, Birmingham Medical College; Surgeon to Hillman Hospital; ex-President of the Jefferson County Medical Society and of the Board of Health of Jefferson County. *Vice-President,* 1905. Avenue G and Twenty-first Street, Birmingham, Ala.

1891.—Dean, G. R., M.D. Fellow of the American Association of Obstetricians and Gynecologists; ex-President of South Carolina State Medical Association; ex-President Association of Surgeons of Southern Railroad. Spartanburg, S. C.

1900.—Deaver, John B., M.D. Surgeon-in-Chief to the German Hospital. 1634 Walnut Street, Philadelphia.

1897.—Dorsett, Walter B., M.D. Professor of Obstetrics and Clinical Gynecology, St. Louis University; Gynecologist to the Missouri Baptist Sanitarium and to Evangelical Deaconess' Hospital. 5070 Washington Boulevard, St. Louis, Mo.

1896.—Doughty, W. H., M.D. Professor of Special Surgery and Surgical Pathology, Medical Department, University of Georgia; Chief Surgeon to Charleston and Western Carolina Railroad. 822 Greene Street, Augusta, Ga.

1890.—Earnest, John G., M.D. Professor of Clinical Gynecology, College of Physicians and Surgeons; formerly Professor of Gynecology, Southern Medical College; Visiting Gynecologist to the Grady Hospital. 44 Houston St., Atlanta, Ga.

1907.—Elbrecht, Oscar Herman, M.D. Superintendent and Surgeon-in-Charge of St. Louis Female Hospital; Vice-President, St. Louis Obstetrical and Gynecological Society. 5600 Arsenal Street, St. Louis, Mo.

1891.—Elkin, William Simpson, M.D. Professor of Operative and Clinical Surgery, Atlanta College of Physicians and Surgeons; ex-President of the Atlanta Society of Medicine; Surgeon to Grady Hospital. 27 Luckie Street, Atlanta, Ga.

1900.—Ferguson, Alexander Hugh, M.D. Professor of Surgery, Chicago Post-Graduate; Professor of Surgery, Medical Department (College of Physicians and Surgeons), University of Illinois. 10 Drexel Square, Chicago, Ill.

1904.—Finney, J. M. T., M.D. Associate Professor of Surgery, Johns Hopkins University; Surgeon to Out-

patients, Johns Hopkins Hospital. 1300 Eutaw Place Baltimore, Md.

1901.—Fort, Rufus E., M.D. Chief Surgeon, Nashville Terminal Company; Surgeon to Southern and Illinois Central Railroads; Surgeon to Nashville Hospital; *Vice-President*, 1907. 209 Seventh Avenue, N., Nashville, Tenn.

1895.—Fortier, S. M., M.D. Visiting Surgeon to Charity Hospital. 4422 St. Charles Avenue, New Orleans, La.

1905.—Frank, Louis, M.D. Professor of Abdominal and Pelvic Surgery, University of Louisville; Visiting Surgeon to the Louisville City Hospital. 1415 Fourth Avenue, Louisville, Ky.

1902.—Freiberg, Albert H., M.D. Professor of Orthopedic Surgery in the Medical College of Ohio, Medical Department of the University of Cincinnati; Orthopedic Surgeon to the Cincinnati Hospital and to the Jewish Hospital of Cincinnati. 19 West Seventh Street, Cincinnati, Ohio.

1895.—Fry, Henry D., M.D. Professor of Obstetrics, Georgetown University; *Vice-President*. 1601 Connecticut Avenue, N. W., Washington, D. C.

1903.—Gale, Joseph A., M.D. Surgeon-General Norfolk and Western R. R.; ex-President of Medical Society of Virginia. Roanoke, Va.

1901.—Gavin, George Edwin, M.D. 11 South Conception Street, Mobile, Ala.

1902.—Gillespie, Reese B., M.D. Surgeon to Tazewell Sanitarium. Tazewell, Va.

1897.—Glasgow, Frank A., M.D. Professor of Clinical Gynecology of St. Louis Medical College; Gynecologist to St. Louis Mullanphy Hospital; on staff of Martha Parsons Free Hospital; Consulting Surgeon to St. Louis Female Hospital. 3894 Washington Boulevard, St. Louis, Mo.

1903.—Goffe, J. Riddle, M.D. Professor of Gynecology, New York Polyclinic Medical School and Hospital; Professor of Gynecology, Dartmouth Medical School; Gynecologist, New York City Hospital; Assistant Gynecologist to New York Skin and Cancer Hospital; Consulting Gynecologist, St. Joseph's Hospital, Yonkers, N. Y.; Attending Surgeon to the Woman's Hospital; Fellow American Gynecological Society. 29 West Forty-sixth Street, New York, N. Y.

Founder.—Goggans, James A., M.D. Ex-President of

the Tri-State Medical Society of Alabama, Georgia, and Tennessee; Senior Councillor of the Medical Association of the State of Alabama; Fellow of the British Gynecological Society. *Vice-President*, 1898. Alexander City, Ala.

1900.—Goldsmith, W. S., M.D. *Treasurer.* 262 Jackson Street, Atlanta, Ga. *Treasurer.*

1892.—Grant, Horace H., M.D. Professor of Surgery in the Hospital College of Medicine; Surgeon to the Louisville City Hospital. 321 Equitable Building, Louisville, Ky.

1905.—Guerry, Le Grand, M.D. Surgeon, Columbia Hospital. Columbia, S. C.

1896.—Gwathmey, Lomax, M.D. Attending Gynecologist to St. Vincent Hospital and Dispensary. Norfolk, Va.

1896.—Haggard, William David, M.D. Professor of Clinical and Abdominal Surgery and Gynecology, Medical Department, University of Tennessee; formerly Professor of Gynecology and Abdominal Surgery, University of the South (Sewanee); Gynecologist to St. Thomas' Hospital; Surgeon to Nashville City Hospital; Member Alumni Association of Woman's Hospital, of New York. *Treasurer*, 1900; *Secretary.* 148 Eighth Avenue, N., Nashville, Tenn.

1892.—Hall, Rufus Bartlett, A.M., M.D. Professor of Clinical Gynecology in the Miami Medical College; Gynecologist to the Presbyterian Hospital; ex-President of the Cincinnati Obstetrical Society; ex-President of the American Association of Obstetricians and Gynecologists; Fellow of British Gynecological Society. 628 Elm Street, Cincinnati, Ohio.

1901.—Hazen, Charles M., M.D. Professor of Physiology, Medical College of Virginia. Bon Air (Richmond), Va.

1896.—Heflin, Wyatt, M.D. Ex-President of the Jefferson County Medical Society. Birmingham, Ala.

1905.—Hendon, George A., M.D. Professor of Principles and Practice of Surgery and Surgical Pathology, Hospital College of Medicine. 1826 Baxter Avenue, Louisville, Ky.

Founder.—Herff, Ferdinand, M.D. 308 East Houston Street, San Antonio, Texas.

1889.—Hill, Robert Somerville, M.D. Gynecologist to the Laurel Hill Hospital; Senior Councillor of the Medical Association of the State of Alabama; ex-President of the

Montgomery County Medical and Surgical Association; former Surgeon of the Second Regiment, Alabama State Militia. Montgomery, Ala.

1902.—Hirst, Barton Cooke, M.D. Professor of Obstetrics, University of Pennsylvania; Fellow of College of Physicians, Philadelphia; Gynecologist to the Howard, Orthopedic, and Philadelphia Hospitals; Fellow of American Gynecological Society. 1821 Spruce Street, Philadelphia, Pa.

1900.—Hoke, Michael, M.D., B.E. 268 Peachtree Street, Atlanta, Ga.

1906.—Holden, Gerry R., M.D. Formerly House Surgeon, Roosevelt Hospital, New York City; formerly Resident Gynecologist, Johns Hopkins Hospital, and Assistant in Gynecology, Johns Hopkins Medical School. 223 West Forsyth Street, Jacksonville, Fla.

1891.—Holmes, J. B. S., M.D. Ex-President of the Tri-State Medical Society of Alabama, Georgia, and Tennessee, ex-President of the Georgia Medical Association; Fellow of the American Association of Obstetricians and Gynecologists. *Vice-President*, 1894. Valdosta, Ga.

1900.—Horsley, John Shelton, M.D. Professor of Principles of Surgery and Clinical Surgery, Medical College of Virginia; Surgeon to Memorial Hospital. *Vice-President*, 1904. 303 West Grace Street, Richmond, Va.

1896.—Hundley, J. Mason, M.D. Associate Professor of Diseases of Women and Children, University of Maryland; President Clinical Society of Baltimore. 1009 Cathedral Street, Baltimore, Md.

1903.—Hunner, Guy Le Roy, M.D. Associate in Gynecology, Johns Hopkins University; Professor of Genito-Urinary Surgery, Woman's Medical College of Baltimore; Gynecologist-in-Chief, St. Agnes' Hospital; Visiting Gynecologist, Church Home and Hebrew Hospital, Baltimore, Frederick City Hospital, Frederick, Md., and Hagerstown Hospital, Hagerstown, Md.; Consulting Gynecologist, Brattleboro Memorial Hospital, Brattleboro, Vt. 1420 Eutaw Place, Baltimore, Maryland.

1900.—Ill, Edward Joseph, M.D. Surgeon to the Woman's Hospital; Medical Director, St. Michael's Hospital Gynecologist and Supervising Obstetrician, St. Barnabas' Hospital; Consulting Gynecologist to German Hospital and Beth Israel Hospital of Newark, N. J.; to All Souls' Hospital,

Morristown, N. J., and to Mountain Side Hospital, Montclair N. J.; Vice-President from New Jersey to Pan-American Congress of 1893. 1002 Broad Street, Newark, N. J.

1908.—Irvin, James S., M.D. Danville, Va.

1889.—Johnson, Joseph Taber, M.D. Professor of Gynecology and Abdominal Surgery, Georgetown University; formerly Gynecologist to Providence Hospital; Chief of Service of Gynecology and Abdominal Surgery, Georgetown University Hospital, and President of the Board of Administration; President of the Woman's Dispensary, and of the Medical Society of the District of Columbia (1887); Member of the British Medical Association; Fellow of the Gynecological Society; President of the Washington Obstetrical and Gynecological Society; Secretary American Gynecological Society, 1886-1890, and President, 1899. *President,* 1899. 926 Farragut Square, Washington, D. C.

Founder.—Johnston, George Ben, M.D. Formerly Consulting Surgeon to the Richmond Eye, Ear, and Throat Infirmary; ex-President of the Richmond Academy of Medicine and Surgery; ex-President of the Medical Society of Virginia; Member of the American Association of Obstetricians and Gynecologists, and First Vice-President, 1896; Member of the Ninth International Medical Congress; Member of the American Surgical Association; Professor of the Practice of Surgery and Clinical Surgery in the Medical College of Virginia, and formerly Professor of Anatomy; Surgeon to the Old Dominion Hospital; Consulting Surgeon to the City Free Dispensary. *Vice-President,* 1892; *President,* 1897. 407 East Grace Street, Richmond, Va.

1908.—Jonas, Ernst, M.D. Clinical Professor of Surgery, Medical Department, Washington University; Chief of Surgical Clinic, Washington University Hospital; Gynecologist to the Jewish Hospital; Surgeon to the Martha Parsons Hospital for Children; Fellow of the American Association of Obstetricians and Gynecologists. 4495 Westminster Place, St. Louis, Mo.

1902.—Jordan, William Mudd, M.D. Surgeon to St. Vincent's Hospital; Gynecologist to Hillman Hospital; formerly Assistant Surgeon, U. S. Marine Hospital Service. Birmingham, Ala.

1890.—Kelly, Howard Atwood, M.D. Founder of Kensington Hospital, Philadelphia; Associate Professor of

Obstetrics, University of Pennsylvania, 1888-89; Professor of Gynecology and Obstetrics, Johns Hopkins University, 1888-99; Professor of Gynecology, Johns Hopkins University; Gynecologist-in-Chief to Johns Hopkins Hospital; Member Associé Etranger de la Société Obstétricale et Gynécologique de Paris; Correspondirendes Mitglied der Gesellschaft f. Geburtshülfe zu Leipzig; Honorary Fellow Edinburgh Obstetrical Society, Royal Academy of Medicine (Ireland), and British Gynecological Society; Member Washington Academy of Sciences; Fellow American Gynecological Society. *President*, 1907. 1418 Eutaw Place, Baltimore, Md.

1907.—Kirchner, Walter C. G., M.D. Superintendent and Surgeon-in-Charge, St. Louis City Hospital. President Medical Society City Hospital Alumni. City Hospital, St. Louis, Mo.

1899.—Kohlman, William, M.D. 3500 Prytania Street New Orleans, La.

1894.—Leigh, Southgate, M.D. Visiting Surgeon to St. Vincent's and Norfolk Protestant Hospitals; First Vice-President Medical Society of Virginia, 1899-1900. 147 Granby Street, Norfolk.

1893.—Lewis, Ernest S., M.D. Professor of Gynecology, Medical Department of Tulane University. *Vice-President*, 1895; *President*, 1896; *Member of Council*, 1896-1903. 124 Baronne Street, New Orleans, La.

1900.—Lloyd, Samuel, M.D. Professor of Surgery, New York Post-Graduate Medical School; Attending Surgeon to Post-Graduate Hospital and St. Francis' Hospital, and Consulting Surgeon to the Benedictine Sanitarium at Kingston, N. Y. 12 West Fiftieth Street, New York, N. Y.

Founder.—Long, John W., M.D. Emeritus Professor of Gynecology and Pediatrics in the Medical College of Virginia; formerly Gynecologist to the Old Dominion Hospital and the Richmond City Dispensary; Consulting Surgeon to the Watts Hospital, Durham; Member, ex-Orator, and ex-Vice-President of the North Carolina Medical Society. *Vice-President*, 1902. Greensboro, N. C.

1904.—Lupton, Frank A., M.D. 716 North Eighteenth Street, Birmingham, Ala.

1902.—McAdory, Wellington P., M.D. Surgeon to Hillman Hospital. Birmingham, Ala.

1895.—McGannon, M. C., M.D. Professor of Gynecology,

Medical Department, University of Nashville; Chief Surgeon, Woman's Hospital. 118 Eighth Avenue, N., Nashville, Tenn.

1893.—McGuire, Stuart, M.D. Professor of the Principles of Surgery and Clinical Surgery, University College of Medicine; Surgeon-in-Charge, St. Luke's Hospital; Visiting Surgeon, Virginia Hospital; Consulting Surgeon, Virginia Home for Incurables. *President.* 518 East Grace Street, Richmond Va.

1891.—McGuire, W. Edward, M.D. Professor of Gynecology, University College of Medicine; Gynecologist to the Virginia Hospital. 411 East Grace Street, Richmond, Va.

1905.—MacLean, Henry Stuart, M.D. Professor of Pathology, University College of Medicine. 406 West Grace Street, Richmond, Va.

1888.—McMurtry, Lewis S., M.D. Ex-President of the American Medical Association; Professor of Abdominal Surgery and Gynecology in the Medical Department of the University of Louisville; Surgeon to the Louisville City Hospital; Gynecologist to St. Mary and St. Elizabeth Hospital; Gynecologist to Gray Street Infirmary; ex-President of the American Association of Obstetricians and Gynecologists; ex-President of the Kentucky State Medical Society; Corresponding Member of the Gynecological Society of Boston; Fellow of the British Gynecological Society; Ordinary Fellow of the Edinburgh Obstetrical Society; Fellow of the American Surgical Society. *President,* 1891; *Member of Council.* Suite 610, The Atherton, Fourth and Chestnut Streets, Louisville, Ky.

1888.—McRae, Floyd Willcox, M.D. Professor of Gastro-intestinal, Rectal, and Clinical Surgery, Atlanta College of Physicians and Surgeons; Surgeon to Grady Hospital; ex-President Medical Association of Georgia; ex-Secretary of Section on Surgery and Anatomy, American Medical Association. *Treasurer,* 1901-1903; *President,* 1904. Peters Building, Atlanta, Ga.

1900.—MacDonald, Willis G., M.D. Professor of Surgery (Adjunct), Albany Medical College; Surgeon to Albany Hospital; Chief Surgeon of South End Dispensary; Fellow of the American Surgical Society. 29 Eagle Street, Albany, N. Y.

1891.—Marcy, Henry Orlando, M.D., LL.D. Ex-President of the American Medical Association; President of

the Section of Gynecology, Ninth International Medical Congress; late President of the American Academy of Medicine; Corresponding Member of the Medico-Chirurgical Society of Bologna, Italy; Fellow of the American Association of Obstetricians and Gynecologists. 180 Commonwealth Avenue, Boston, Mass.

1899.—Martin, Edmund Denegre, M.D. Professor of Minor and Clinical Surgery, New Orleans Polyclinic; Visiting Surgeon to the Charity Hospital; Consulting Surgeon to the Eye, Ear, Nose, and Throat Hospital; President Orleans Parish Medical Society; ex-Vice-Pesident American Medical Association. 115 Chartres Street, New Orleans, La.

1904.—Mason, J. M., M.D. Gynecologist to St. Vincent Hospital. 1915 Sixteenth Avenue, S., Birmingham, Ala.

1899.—Mastin, William M., M.D. Fellow of the American Surgical Association; Member of the American Association of Genito-urinary Surgeons; Surgeon to the Mobile City Hospital. Joachim and Conti Streets, Mobile, Ala.

1893.—Matas, R., M.D. Professor of Surgery, Medical Department of Tulane University; Fellow of the American Surgical Association. 624 Gravier Street, New Orleans, La.

1896.—Matthews, William P., M.D. Professor of Anatomy, Medical College of Virginia; Orthopedic Surgeon to the Old Dominion Hospital. Richmond, Va.

1902.—Mayo, Charles H., M.D. Attending Surgeon, St. Mary's Hospital; Member American Surgical Society; ex-President, Western Surgical and Gynecological Association and of Minnesota State Medical Society. Rochester, Minn.

Founder.—Meriwether, Frank T., M.D. Assistant Surgeon, U. S. A. (Retired). Asheville, N. C.

1899.—Michinard, P. E., M.D. 624 Gravier Street, New Orleans, La.

1888.—Miller, C. Jeff., M.D. Professor of Operative Gynecology, New Orleans Polyclinic; Visiting Gynecologist to Charity Hospital. 1719 Jackson Avenue, New Orleans, La.

1907.—Mitchell, James F., M.D. Surgeon to Providence Hospital. 1344 Nineteenth Street, Washington, D. C.

1901.—Mixter, Samuel Jason, M.D. Surgeon, Massachusetts General Hospital; Consulting Surgeon, Massachusetts Charity Eye and Ear Infirmary; Instructor of Surgery, Harvard Medical School. 180 Marlborough Street, Boston, Mass.

1904.—Moran, John F., M.D. Professor of Obstetrics, Georgetown University; Obstetrician to Georgetown University Hospital and Columbia Hospital for Women. Washington, D. C.

1903.—Morgan, James B., M.D. Professor of Anatomy and Clinical Surgery, Medical College of Georgia; Chairman Board of Censors, Georgia Medical Association. 1272 Broad Street, Augusta, Ga.

1902.—Morris, Lewis C., M.D. Professor of Anatomy and Associate Professor of Gynecology, Birmingham Medical College; Councillor of Medical Association, State of Alabama; Vice-President of Tri-State Medical Society of Alabama, Georgia, and Tennessee. 716 North Eighteenth Street, Birmingham, Ala.

1900.—Morris, Robert Tuttle, M.D. Professor of Surgery, New York Post-Graduate Medical School and Hospital. 616 Madison Avenue, New York, N. Y.

1901.—Mullally, Lane, M.D. Professor of Obstetrics and Diseases of Children, Medical College, State of South Carolina; Visiting Physician in Obstetrics and Pediatrics, Roper Hospital. Charleston, S. C.

1905.—Munro, John Cummings, M.D. Surgeon-in-Chief, Carney Hospital; Consulting Surgeon, Quincy Hospital and Framingham Hospital; President of the Society of Clinical Surgery; Member American Surgical, American Academy, and of the Association of American Anatomists. 173 Beacon Street, Boston, Mass.

1891.—Murfree, James Brickle, M.D. Professor of Surgery, University of the South (Sewanee); ex-President of the Tennessee State Medical Society, of the Tri-State Medical Society of Alabama, Georgia, and Tennessee. Murfreesboro, Tenn.

1894.—Murphy, J. B., M.D. Professor of Surgery, Northwestern University; Professor of Surgery, Post-Graduate School and Hospital; Attending Surgeon, Cook County and Mercy Hospitals. 100 State Street, Chicago, Ill.

Founder.—Nash, Herbert Milton, M.D. Consulting Surgeon to the Retreat for the Sick (Hospital), Norfolk, Consultant to the Staff of St. Vincent's Hospital; ex-President of the Norfolk City Medical Society; Member of the State Board of Medical Examiners of Virginia. 296 Freemason Street, Norfolk, Va.

1889.—Nicolson, William Perrin, M.D. Professor of Anatomy and Clinical Surgery, Atlanta College of Physicians and Surgeons; Visiting Surgeon to Grady Hospital; Senior Surgeon to Wesley Memorial Hospital; Senior Surgeon, St. Joseph Hospital. *Vice-President*, 1900. Prudential Building, Atlanta, Ga.

1896.—Noble, Charles P., M.D. Surgeon-in-Chief, Kensington Hospital for Women; Consulting Surgeon, Woman's Hospital; Lecturer on Gynecology, Philadelphia Polyclinic. 1500 Locust Street, Philadelphia, Pa.

1890.—Noble, George H., M.D. Dean and Professor of Abdominal Surgery and Clinical Gynecology, Atlanta School of Medicine; Gynecologist of Grady Hospital; Senior Gynecologist, Wesleyan Memorial Hospital, Atlanta; Fellow of the American Gynecological Association and the American Association of Obstetricians and Gynecologists; ex-President of the Medical Association of Georgia; ex-Secretary of the Section of Obstetrics, American Medical Association. *Vice-President*, 1901; *President*, 1905. 131 South Pryor Street, Atlanta, Ga.

1903.—Nolen, William L., M.D. Ex-President, Chattanooga Medical Society. Salem, Va.

1890.—Nunn, R. J., M.D. Savannah, Ga.

1902.—O'Brien, Matthew Watson, M.D. Surgeon, Southern and Chesapeake and Ohio Railways; Member of the American Association for the Advancement of Science. 908 Cameron Street, Alexandria, Va.

1901.—Ochsner, A. J., M.D. Adjunct Professor of Clinical Surgery, College of Physicians and Surgeons; Surgeon-in-Chief, Augustana and St. Mary's Hospital. 710 Sedgwick Street, Chicago, Ill.

1903.—Ochsner, Edward H., M.D. Surgeon to Augustana and St. Mary's Hospital. 710 Sedgwick Street, Chicago, Ill.

1904.—Oechsner, John F., M.D. Professor of Orthopedic Surgery and the Surgery of Children, Post-Graduate Medical Department, Tulane University of Louisiana; Visiting Surgeon, Charity Hospital. Macheca Building, New Orleans, La.

1902.—Oliver, John Chadwick, M.D. Dean and Professor of Operative Surgery, Miami Medical College; Surgeon to the Cincinnati, Christ, and Presbyterian Hospitals. 628 Elm Street, Cincinnati, Ohio.

Founder.—Paine, John Fannin Young, M.D. Professor of Obstetrics and Gynecology in the Medical Department, University of Texas; Gynecologist and Obstetrician, John Sealy Hospital; Fellow of the American Association of Obstetricians and Gynecologists; ex-President of the Texas Medical Association; Fellow of the Texas Academy of Science. 2177 Market Street, Galveston, Texas.

1888.—Parham, F. W., M.D. Professor of Surgery in the New Orleans Polyclinic. *Vice-President*, 1899; *President*, 1908. 1429 Seventh Street, New Orleans, La.

1900.—Park, Roswell, M.D. Professor of Surgery, Medical Department, University of Buffalo; Surgeon, Buffalo General Hospital; Member of German Congress of Surgeons, Italian Surgical Society, American Surgical Association, American Orthopedic, and American Genito-urinary Associations. 510 Delaware Avenue, Buffalo, N. Y.

1899.—Perkins, W. M., M.D. Chief of the Clinic Chair of General Clinical and Operative Surgery, New Orleans Polyclinic; Assistant Demonstrator of Operative Surgery, Medical Department, Tulane University of Louisiana; Visiting Surgeon to the Charity Hospital. Macheca Building, New Orleans, La.

1908.—Peterson, Reuben, A.M., M.D. Professor of Obstetrics and Gynecology, University of Michigan; Obstetrician and Gynecologist-in-Chief to the University of Michigan Hospital. Ann Arbor, Mich.

1899.—Platt, Walter Brewster, M.D. Surgeon to the Robert Garrett Hospital for Children. 802 Cathedral Street, Baltimore, Md.

1889.—Polk, William M., M.D. Dean and Professor of Obstetrics and Gynecology, Cornell University Medical College; Gynecologist to Bellevue Hospital; Consulting Surgeon to St. Luke's, St. Vincent's, New York Lying-in, and Trinity Hospitals; ex-President of American Gynecological Society, and New York Obstetrical Society. 7 East Thirty-sixth Street, New York.

1900.—Porter, Miles F., M.D. Fellow American Surgical Association. 47 West Wayne Street, Fort Wayne, Ind.

1889.—Potter, William Warren, M.D. Consulting Gynecologist to the Woman's Hospital; Consulting Surgeon to the Buffalo General Hospital; President and Examiner in

Obstetrics, New York State Medical Examining and Licensing Board; Chairman of Section of Obstetrics and Diseases of Women, American Medical Association, 1890; President of the Buffalo Obstetrical Society, 1884-1886; President of the Medical Society of the State of New York, 1891; Executive President of the Section of Gynecology and Abdominal Surgery, Pan-American Medical College, 1893. 238 Delaware Street, Buffalo, N. Y.

1889.—Price, Joseph, M.D. Physician-in-Charge of the Obstetrical and Gynecological Department of the Philadelphia Dispensary; Fellow of the American Association of Obstetricians and Gynecologists; ex-Chairman, Section of Diseases of Women and Obstetrics, American Medical Association. *Vice-President*, 1893. 241 North Eighteenth Street, Philadelphia, Pa.

1900.—Ransohoff, Joseph, M.D., F.R.C.S. Professor of Anatomy and Clinical Surgery, Medical College of Ohio; Surgeon to Cincinnati, Good Samaritan, and Jewish Hospitals; Member American Surgical Association. 19 West Seventh Street, Cincinnati, Ohio.

1890.—Reed, Charles Alfred Lee, M.D. Ex-President of the American Medical Association; Professor of Gynecology and Abdominal Surgery in the Cincinnati College of Medicine and Surgery; Surgeon to the Cincinnati Free Hospital for Women; Fellow of the American Association of Obstetricians and Gynecologists; Fellow of the British Gynecological Society; ex-Chairman of the Section on Obstetrics and Diseases of Women of the American Medical Association; Secretary-General of the Pan-American Medical Congress 1893; Honorary Member of the Medical Society of the State of New York. Corner Seventh and Race Streets, Cincinnati, O.

1900.—Rees, Charles Mayrant, M.D. Professor of Abdominal Surgery and Gynecology, Charleston Medical School; Abdominal Surgery and Gynecology, City Hospital; Gynecologist to Shirro's Dispensary. Charleston, S. C.

1899.—Richardson, Maurice Howe, M.D. Visiting Surgeon to the Massachusetts General Hospital; Assistant Professor of Clinical Surgery, Harvard Medical School; Mosely Professorship of Surgery to Harvard University. 224 Beacon Street, Boston, Mass.

1888.—Roberts, William O., M.D. Professor of Prin-

ciples of Surgery and Clinical Surgery, Medical Department of the University of Louisville; formerly Secretary of the Surgical Section of the American Medical Association. *Vice-President*, 1889. 1520 Third Street, Louisville, Ky.

1901.—Robins, Charles Russell, M.D. Professor of Gynecology, Medical College of Virginia; Gynecologist to the Memorial Hospital; Surgeon to the Atlantic Coast Railroad. 8 West Grace Street, Richmond, Va.

1889.—Robinson, William Lovaille, M.D. Fellow of the American Association of Obstetricians and Gynecologists; ex-President of the Danville Medical Society; Member of the Medical Examining Board of Virginia; ex-President of Virginia Medical Society. *Vice-President*, 1899. 753 Main Street, Danville, Pa.

1906.—Rogers, Carey Pegram, M.D. Surgeon to De Soto Sanatorium; Surgeon, Sea Board Air Line Railway; formerly House Surgeon, Johns Hopkins Hospital. 223 West Forsyth Street, Jacksonville, Fla.

1901.—Rogers, Mack, M.D. Professor of Anatomy, Birmingham Medical College. 212 Twentieth Street, Birmingham, Ala.

1901.—Rosser, Charles M., M.D. Professor of Surgery, Baylor University, College of Medicine; Consulting Surgeon, Parkland Hospital; Attending Surgeon, Texas Baptist Memorial Sanitarium; ex-Vice-President Texas State Medical Association; Vice-President, Tri-State Society of Texas, Louisiana and Arkansas. *Treasurer*, 1904–07. 432 Gaston Avenue, Dallas, Texas.

1899.—Royster, Hubert A., A.B., M.D. Professor of Gynecology and Dean of the Faculty, Medical Department University of North Carolina; Gynecologist to Rex Hospital; Surgeon-in-Chief, St. Agnes' Hospital. *Vice-President*, 1907. Tucker Building, Raleigh, N. C.

1901.—Runyan, Joseph P., M.D. 203 West Second Street, Little Rock, Ark.

1908.—Russell, Wm. Wood, M.D. Associate Professor of Gynecology, Johns Hopkins University; Associate in Gynecology, Johns Hopkins Hospital; Gynecologist to Union Protestant Infirmary, Baltimore. Baltimore, Md.

1893.—Saunders, Bacon, M.D. Professor of Surgery and Clinical Surgery and Dean of Faculty of Medical Department, Fort Worth University; ex-President, Texas State Medical

Association. *Vice-President,* 1903; *Member of Council.* Ninth and Houston Streets, Fort Worth, Texas.

Founder.—Schilling, Nicholas, M.D. Cedar Bayou, Texas.

1907.—Scott, Arthur Carroll, M.D. Senior Surgeon, Temple Sanatorium. Temple, Texas.

1899.—Shands, A. R., M.D. Professor of Orthopedic Surgery in the Medical Department of the George Washington University and in the University of Vermont; Orthopedic Surgeon to the George Washington University Hospital, the Emergency Hospital, and Central Dispensary; Charter Member Washington Academy of Sciences; Member American Orthopedic Association; and Honorary Member of Medical Society of Virginia. 901 Sixteenth Street, N. W., Washington, D. C.

1902.—Sherrill, J. Garland, M.D. Professor of Surgery and Clinical Surgery, University of Louisville; Consulting Surgeon to Louisville Hospital. 633 St. Charles Place, Louisville, Ky.

**Founder.*—Shivers, Offa Lundsford, M.D.

1893.—Simons, Manning, M.D. Professor of Clinical Surgery, Medical College, State of South Carolina; Surgeon to St. Francis Xavier's Infirmary; Surgeon to City Hospital; ex-President Medical Society of South Carolina; President of the South Carolina Medical Association; Member American Association of Obstetricians and Gynecologists; ex-Vice-President Tri-State Medical Society of Virginia and the Carolinas. *Vice-President,* 1895 and 1900; *President,* 1901. 111 Church Street, Charleston, S. C.

1900.—Simpson, Frank Farrow, M.D. Assistant Gynecologist to Mercy Hospital; Gynecologist to Out-patient Department, Mercy Hospital. 524 Pennsylvania Avenue, Pittsburgh, Pa.

1899.—Smythe, Frank Davie, M.D. Surgeon to St. Joseph's Hospital; Assistant Professor of Surgery, Memphis Hospital Medical College; Demonstrator of Operative Surgery; formerly Member of the State Board of Examiners of Mississippi. Porter Building, Memphis, Tenn.

1904.—Stokes, James Ernest, M.D. Salisbury, N. C.

Founder.—Stone, Isaac Scott, M.D. Clinical Professor Gynecology, Georgetown University; Gynecologist to Columbia Hospital, and Associate Gynecologist to Georgetown

University Hospital; Member American and British Gynecological Societies; Honorary Fellow of Medical Society of the State of New York; Fellow of the Medical Society of Virginia; Member Washington Academy of Sciences; Washington Obstetrical and Gynecological Society. 1618 Rhode Island Avenue, N. W., Washington, D. C.

1894.—Talley, Dyer F., M.D. Associate Professor of Surgery, Birmingham Medical College; Attending Surgeon to Hillman Hospital; Surgeon to the Talley and McAdory Infirmary; Ex-President of the Jefferson County Medical Society; Member of the Southern Medical Association; Member of the Pan-American Medical Association; Member of the Alumni Association of the Charity Hospital of Louisiana; Member of the Board of Censors of the Jefferson County Medical Society; Member of the Alabama State Board of Censors, Committee of Public Health and Examiners; Fellow of the American Association of Obstetricians and Gynecologists. 1801 Seventh Avenue, Birmingham, Ala.

Founder.—Taylor, Hugh M., M.D. Professor of Practice of Surgery and Clinical Surgery, University College of Medicine; Surgeon to the Virginia Hospital; ex-President of the Virginia Board of Medical Examiners. 6 North Fifth Street, Richmond, Va.

1898.—Taylor, William Wood, A.B., M.D. Gynecologist to St. Joseph's and the Memphis City Hospitals. 246 Randolph Building, Memphis, Tenn.

1892.—Thompson, J. E., M.D. Professor of Surgery in the University of Texas. Galveston, Texas.

1890.—Tompkins, Christopher, M.D. Professor of Obstetrics in the Medical College of Virginia. *Vice-President*, 1903. 116 East Franklin Street, Richmond, Va.

1908.—Torrance, Gaston, M.D. Member Surgical Staff, Hillman's Hospital; also the Sisters' Hospital and St. Vincent's; Fellow of the American Association of Obstetricians and Gynecologists. 325 to 328 Woodward Building, Birmingham, Ala.

1888.—Tuholske, Herman, M.D. Professor of Surgery, Medical Department, Washington University; Consulting Surgeon, St. Louis City Hospital; Surgeon to St. Louis Polyclinic Hospital, etc. 465 North Taylor Street, St. Louis, Missouri.

1905.—Vance, Ap Morgan, M.D. Surgeon to St. Mary

and Elizabeth Hospital; Consulting Surgeon, Louisville City Hospital. 921 Fourth Street, Louisville, Ky.

1893.—Vander Veer, Albert, M.D. Professor of Clinical, Didactic, and Abdominal Surgery, Albany Medical College; ex-President of the American Surgical Association; ex-President of the American Association of Obstetricians and Gynecologists; ex-President of the Medical Society of the State of New York. 28 Eagle Street, Albany, N. Y.

1891.—Walker, Edwin, M.D., Ph.D. Gynecologist to the Evansville City Hospital; ex-President Mississippi Valley Medical Association; President of the Indiana State Medical Society; Fellow of the American Association of Obstetricians and Gynecologists. 712 Upper Fourth Street, Evansville, Ind.

1905.—Wathen, John R., A.B., M.D. Professor of Principles and Practice of Surgery and Clinical Surgery, University of Louisville; Surgeon to St. Anthony's, Louisville City, and University of Louisville Hospitals. 628 Fourth Avenue, Louisville, Ky.

1898.—Watkins, Isaac Lafayette, M.D. Ex-President of the Montgomery County Medical and Surgical Society. Montgomery, Ala.

1907.—Watts, Stephen H., M.D. Professor of Surgery University of Virginia; Surgeon-in-Chief and Director of the University of Virginia Hospital. University of Virginia, Charlottesville, Va.

1901.—Werder, X. O., M.D. Gynecologist, Mercy Hospital, Pittsburgh: Professor of Gynecology, West Pennsylvania Medical College; Consulting Surgeon to the South Side Hospital, Allegheny General Hospital, St. Francis' Hospital, etc. 524 Pennsylvania Avenue, Pittsburgh, Pa.

1888.—Westmoreland, Willis F., M.D. Professor of Surgery, Atlanta College of Physicians and Surgeons. *Vice President.* 241 Equitable Building, Atlanta, Ga.

1904.—Whaley, T. P., M.D. Lecturer on Genito-urinary and Renal Surgery, Charleston Medical School; Lecturer on Diseases of Skin, Medical College of the State of South Carolina; Surgeon to Sherra's Dispensary; Visiting Surgeon, Charleston City Hospital. 13 Wentworth Street, Charleston, S. C.

1902.—Whitacre, Horace J., M.D. Professor of Pathology and Lecturer on Surgery, Medical Department,

University of Cincinnati, also Medical College of Ohio; Surgeon to Christ Hospital; Consulting Surgeon to Speer's Hospital. 22 West Seventh Street, Cincinnati, Ohio.

1900.—Williams, J. Whitridge, A.B., M.D. Professor of Obstetrics, Johns Hopkins University; Obstetrician-in-Chief, Johns Hopkins Hospital; Gynecologist to the Union Protestant Infirmary. 1128 Cathedral Street, Baltimore, Md.

1907.—Willis, A. Murat, M.D. Instructor in Abdominal Surgery, Medical College of Virginia; Junior Surgeon to Memorial Hospital, Richmond, Va. 405 East Grace Street, Richmond, Va.

Founder.—Wilson, J. T.. M.D. Ex-President of the North Texas Medical Association; President of the Texas Medical Association; Superintendent of the State Hospital for the Insane. *Vice-President,* 1891. Sherman, Texas.

1905.—Winslow, Randolph, M.D. Professor of Surgery, University of Maryland; Chief Surgeon, University Hospital; Consulting Surgeon, Hebrew Hospital, and to the Hospital for Crippled Children. 1900 Mt. Royal Terrace, Baltimore, Md.

1905.—Witherspoon, T. Casey, M.D. Formerly Professor of Operative and Clinical Surgery, Medical Department, St. Louis University; Member of American Association of Anatomists. 307 West Granite Street, Butte, Mont.

1891.—Wyeth, John Allen, M.D. Ex-President of the American Medical Association (1901). Professor of Surgery in the New York Polyclinic; Consulting Surgeon to St. Elizabeth's Hospital; Visiting Surgeon to Mt. Sinai Hospital and Polyclinic Hospital; Honorary Member of the Texas State Medical Association; ex-President of the New York State Medical Association; ex-President of the New York Pathological Society. 19 West Thirty-fifth Street, New York, N. Y.

1900.—Wysor, John C., M.D. Surgeon-in-Charge, Chesapeake and Ohio Hospital. Clifton Forge, Va.

1900.—Young, Hugh H., M.D. Chief of Clinic, Genito-urinary Surgery, Johns Hopkins Hospital. 1005 North Charles Street, Baltimore, Md.

1902.—Zinke, E. Gustav, M.D. Professor of Obstetrics in Medical College of Ohio; Obstetrician and Gynecologist to German Protestant Hospital; Attending Obstetrician to Ohio Maternity; President of American Association of Obstetricians and Gynecologists. 13 Garfield Place, Cincinnati, Ohio.

CONSTITUTION.

ARTICLE I.

The name of this Association shall be THE SOUTHERN SURGICAL AND GYNECOLOGICAL ASSOCIATION.

ARTICLE II.

The object of this Association is to further the study and practice of surgery and gynecology among the profession of the Southern States.

ARTICLE III.

This Association shall adopt and conform to the Code of Ethics of the American Medical Association.

ARTICLE IV.

SECTION 1. Any reputable physician who practises surgery or gynecology, and who is vouched for by two members of the Association and recommended by the Council, shall be eligible to membership in this body.

SEC. 2. The honorary members shall not exceed ten in number, and shall enjoy all the privileges of other members, excepting to vote or hold office, but shall not be required to pay any fee.

ARTICLE V.

SECTION 1. The officers of this Association shall be a President, two Vice-Presidents, a Secretary, a Treasurer, and a Council, elected by ballot.

SEC. 2. The President and Vice-Presidents shall be elected for one year, and the President shall not be eligible for reëlection at any time; the Secretary and Treasurer, each, for five years; and the Council as provided for in the By-laws.

ARTICLE VI.

SECTION 1. It shall be the duty of the President to preside at all meetings of the Association; to give the casting vote; to see that the rules of order and decorum be properly enforced in all deliberations of the Association; to sign the approved proceedings of each meeting, and to approve such orders as may be drawn upon the Treasurer for expenditures ordered by the Association.

SEC. 2. In the absence of the President the first Vice-President shall preside, and in his absence the second Vice-President shall preside.

SEC. 3. In the absence of all three, the Association shall elect one of its members to preside *pro tem.*

SEC. 4. It shall be the duty of the Secretary to keep a true and correct record of the proceedings of the meetings; to preserve all books, papers, and articles belonging to the archives of the Association; to attest all orders drawn on the Treasurer for moneys appropriated by the Association; to keep the account of the Association with its members; to keep a register of the members, with the dates of their admission and places of residence. He shall collect all moneys due from the members and pay to the Treasurer, taking his receipt for the same. He shall report such unfinished business of previous meetings as may appear on his books requiring action, and attend to such other business as the Association may direct. He shall also supervise and conduct all the correspondence of the Association, and edit the TRANSACTIONS under the direction of the Council.

SEC. 5. It shall be the duty of the Treasurer to keep a correct record of all moneys received from the hands of the Secretary, giving his receipt for the same; pay them out by order of the Association as indorsed by the President and attested by the seal in the hands of the Secretary.

SEC. 6. If shall be the duty of the President of the Association to appoint an Auditing Committee, consisting of three members of the Association, whose duty it shall be to examine the books of the Secretary and Treasurer, and report on the same on the last day of the session.

ARTICLE VII.

Vacancies occurring in the offices of the Association shall be filled by appointment of the President until the next meeting. He shall also have the appointment of all committees not otherwise provided for.

ARTICLE VIII.

This Constitution shall take effect immediately from the time of its adoption, and shall not be amended except by a written resolution, which shall lie over one year, and receive a vote of two-thirds of the members present.

ARTICLE IX.

Any member who for three consecutive years fails to attend the meetings or present a paper shall be dropped from the roll of membership.

ARTICLE X.

The membership of the Association shall be limited to two hundred.

ARTICLE XI.

All members who have been in continuous membership for twenty years and have attended fifty per cent. of the meetings shall become life members and be exempt from dues.

BY-LAWS.

ARTICLE I.

The Southern Surgical and Gynecological Association shall meet annually on the Tuesday of the week preceding the week in which Christmas occurs, at 10 A.M., at such place as may be designated at the preceding meeting.

ARTICLE II.

The members present shall constitute a quorum for business.

ARTICLE III.

The annual dues of each member shall be $10, paid in advance.

ARTICLE IV.

The usual parliamentary rules governing deliberative bodies shall govern the business workings of this Association.

ARTICLE V.

All questions before the Association shall be determined by a majority of the votes present.

ARTICLE VI.

The President shall deliver an annual address at each meeting of the Association.

ARTICLE VII.

The Secretary of the Association shall receive at each annual Session a draft from the President, drawn on the Treasurer, for the sum of $500, for services rendered the Association, and to this shall be added the necessary expense incurred in the discharge of his official duties.

ARTICLE VIII.

It shall be the duty of the Secretary, one month prior to the annual meeting, to notify the members of the Association, and urge their attendance.

ARTICLE IX.

The authors of papers shall notify the Secretary, six weeks prior to the meeting, of the titles of their essays, so that they may be incorporated in the preliminary programme.

ARTICLE X.

COUNCIL.

The Council shall consist of five members; and of those elected at the primary meeting, the first shall serve five years, the second four, the third three, the fourth two, and the fifth one year; so that subsequently one member of the Council shall be elected annually to serve five years. No member of the Council shall be eligible for reëlection. The President and Secretary shall be *ex-officio* members of the Council.

This Council shall organize by electing a Chairman and Secretary, and shall keep a record of its proceedings.

The duties of this Council shall be—

1. To investigate applications for membership and report to the Association the names of such persons as are deemed worthy.

2. To take cognizance of all questions of an ethical, judicial, or personal nature, and upon these the decision of the Council shall be final; *provided*, that appeal may be taken from such decision of the Council to the Association, under a written protest, which protest shall be sustained by the Association, and the matter shall then be referred to a special committee, with power to take final action.

3. All motions and resolutions before the Association shall be referred to the Council without debate, and it shall report by recommendation at as early an hour as possible.

ARTICLE XI.

The President shall appoint at each annual meeting a Committee of Arrangements.

ARTICLE XII.

The Council shall have full power to omit from the published TRANSACTIONS, in part or in whole, any paper that may be referred to it by the Association, unless specially instructed to the contrary by the Association, which will be determined by vote.

ARTICLE XIII.

Any member failing to pay his dues for more than one year shall be dropped.

ARTICLE XIV.

No paper shall be read before this Association which does not deal strictly with a subject of surgical or gynecological importance.

ARTICLE XV.

No paper read before this Association shall be published in any medical journal or pamphlet for circulation, as having been read before the Association, without having received the indorsement of the Council.

ARTICLE XVI.

The reading of papers shall be limited to twenty minutes each, except by permission of the Association.

MINUTES OF THE PROCEEDINGS

AT THE

TWENTY-FIRST ANNUAL MEETING

OF

THE SOUTHERN

SURGICAL AND GYNECOLOGICAL

ASSOCIATION,

HELD AT THE

PLANTERS' HOTEL,

St. Louis, Missouri,

DECEMBER 15, 16 AND 17, 1908.

TWENTY-FIRST ANNUAL MEETING.

FIRST DAY.—*Tuesday, December* 15, 1908.

The following-named members were present:

BAKER, JAMES NORMENT
BALDRIDGE, FELIX E.
BEVAN, ARTHUR D.
BONIFIELD, CHARLES L.
BOSHER, LEWIS C.
BROOME, G. WILEY
BROWN, JOHN YOUNG
BURCH, LUCIUS E.
BYFORD, HENRY T.
CALDWELL, C. E.
CANNADY, JOHN EGERTON
CAROTHERS, ROBERT
CARR, WILLIAM P.
CATHCART, R. S.
CLARK, JOHN G.
CLARK, S. M. D.
CRILE, GEORGE W.
CUNNINGHAM, RUSSELL
DAVIS, JOHN D. S.
DORSETT, WALTER B.
DOUGHTY, W. H.
ELBRECHT, OSCAR H.
FRANK, LOUIS
GAVIN, GEORGE E.
GOLDSMITH, W. S.
GUERRY, LE GRAND
HAGGARD, W. D.
HALL, RUFUS B.
HAZEN, CHARLES M.
HENDON, GEORGE A.
HILL, R. S.
HORSLEY, JOHN S.
HUNNER, GUY LE ROY
KIRCHNER, W. C. G.
LONG, JOHN W.
MCGANNON, M. C.
MCGUIRE, STUART
MCMURTRY, LEWIS S.
MCRAE, FLOYD W
MACLEAN, H. S.
MAYO, CHARLES H.
MERIWETHER, F. T.
MURPHY, J. B.
NOBLE, CHARLES P.
OCHSNER, E. H.
PARHAM, F. W.
POLK, W. M.
PORTER, MILES F.
RICHARDSON, M. H.
ROBINS, C. R.
ROSSER, CHAS. M.
SAUNDERS, BACON
SHERRILL, J. GARLAND
SIMPSON, FRANK F.
SMYTHE, F. D.
TAYLOR, W. W.
THOMPSON, J. E.
TUHOLSKE, HERMAN

WATHEN, JOHN R.
WATKINS, I. L.
WHITACRE, HORACE J.
WILLIS, A. M.
WINSLOW, RANDOLPH
WITHERSPOON, T. CASEY
ZINKE, E. GUSTAV

Letters and messages of regret were received from the following Fellows who were unable to attend the meeting: Dr. John B. Deaver, Dr. Edward J. Ill, Dr. W. B. Coley, Dr. A. Vander Veer, Dr. Louis C. Morris, Dr. I. S. Stone, Dr. E. A. Balloch, Dr. Hugh H. Young, Dr. Henry D. Fry, Dr. J. M. T. Finney, Dr. J. Wesley Bovée, Dr. Robert T. Morris, Dr. J. A. Danna, Dr. T. P. Whaley, Dr. Daniel H. Craig, and Dr. J. Whitridge Williams.

Morning Session.—The Association met at the Planters' Hotel, and was called to order at 9.40 A.M. by the President, Dr. F. W. Parham, of New Orleans, Louisiana, who said: It is my pleasure to open this the twenty-first annual session of the Southern Surgical and Gynecological Association. I am sure, from the program we have before us, we may confidently expect a most successful meeting—possibly a meeting that will exceed in its results the one which was held in New Orleans last year.

It affords me very great pleasure to introduce to you Dr. John Young Brown, Chairman of the Committee of Arrangements. (Applause.)

Dr. Brown said: "Mr. President and Fellows of the Southern Surgical and Gynecological Association, on behalf of the resident members and of the medical profession of St. Louis, I wish to extend to you a cordial welcome to our city.

"Realizing that you meet purely for scientific purposes, we have endeavored to arrange the entertainments so that there will be no conflict with the sessions of the Association.

"The President's address will be delivered tonight at the Auditorium of the St. Louis Medical Society. The meeting will be called to order promptly at eight o'clock. Immediately following the meeting, Dr. Tuholske will entertain the Society at his residence.

"Tomorrow night there will be a banquet tendered the Association by the Resident Fellows at the Planters' Hotel at eight o'clock.

"These entertainments will not interfere with the sessions

of the Association, and between the sessions we will endeavor to make your stay pleasant, and we know your stay here will be most profitable to us." (Applause.)

Papers were read, as follows:

1. "Syphilitic Hyperplasia of Bones," by Dr. C. E. Caldwell, of Cincinnati, Ohio.

Discussed by Dr. Bevan, and in closing by the essayist.

On motion of Dr. Haggard, the courtesies of the floor were extended to Dr. R. C. Coffey, of Portland, Oregon, and Dr. S. C. Graves, of St. Louis.

2. "Myoma of the Stomach," by Dr. James E. Thompson, of Galveston, Texas.

This paper was discussed by Drs. Richardson, Mayo, Crile, and in closing by the essayist.

3. "Further Observations on Transfusion, with a Note on Hemolysis," by Dr. George W. Crile, of Cleveland, Ohio.

Discussed by Drs. Coffey, Davis, and in closing by the author.

4. "Conclusions Based on Observations of Five Hundred Cases of Fracture of the Skull," by Dr. Walter C. G. Kirchner, of St. Louis, Mo.

Discussed by Drs. Davis, Horsley, Richardson, Crile, Porter, Guerry, Cunningham, Whitacre, and in closing by the essayist.

5. "Urethral Transplantation, with Report of a Case," by Dr. John D. S. Davis, of Birmingham, Alabama.

Discussed by Dr. Bevan.

6. "Fracture of the Elbow-joint, with Report of Cases, Illustrated with Lantern Slides; Report of a Case of Multiple Epithelioma of the Skin, with Lantern Slides," by Dr. Robert Carothers, of Cincinnati, Ohio.

This paper was discussed by Drs. Caldwell, Thompson, Cunningham, Ochsner, Haggard, and in closing by the essayist.

Dr. R. S. Hill, of Montgomery, Alabama, moved that the Association sends its greetings to Dr. William T. Bull, with hope for a speedy recovery. Seconded and carried.

On motion, the Association adjourned until 2.30 P.M.

Afternoon Session.—The Association reassembled at 2.30 P.M., with the President in the Chair.

7. "Suprapubic Prostatectomy," by Dr. Arthur Dean Bevan, of Chicago.

Discussed by Drs. Sherrill, Mayo, Bowers, Lewis, Porter, Richardson, McRae, and in closing by the author.

8. "Dermoid Cyst of the Kidney," by Dr. William S. Goldsmith, of Atlanta, Georgia.

9. "Stone in the Kidney," by Dr. Maurice H. Richardson, of Boston.

These two papers were discussed together by Drs. Gavin, Noble, Lewis, Parham, McGuire, Bevan, and in closing by Dr. Richardson.

On motion, the Association adjourned until 8 P.M.

Evening Session.—The Association reassembled at 8 P.M., in the Auditorium of St. Louis Medical Society, and was called to order by Dr. Herman Tuholske.

The President, Dr. Parham, delivered his Address, selecting for his subject, "Conservative Surgery, Then and Now."

Adjourned.

SECOND DAY.—*Wednesday, December* 16, 1908.

Morning Session.—The Association met at 9.40 A.M., with the President in the Chair.

10. "Porro-Cesarean Section, with Report of a Case," by Dr. Frank D. Smythe, of Memphis, Tennessee.

11. "Elective Cesarean Section," by Dr. Miles F. Porter, of Fort Wayne, Indiana.

These two papers were discussed jointly by Drs. Zinke, Byford, Noble, Richardson, Mayo, Hall, Bonifield, Haggard, Kirchner, McGannon, and in closing by the essayists.

On motion of Dr. Haggard, the privileges of the floor were extended to the officers of the Mississippi Valley Medical Association, namely, Dr. J. A. Witherspoon, President; Dr. Henry E. Tuley, Secretary; and Dr. Samuel C. Stanton, Treasurer; also to Drs. Franklin H. Martin, and L. Ryan, of Chicago.

12. "Appendicostomy in Pernicious Anemia," by Dr. L. E. Burch, of Nashville, Tennessee.

Discussed by Drs. Bonifield and McLean.

13. "The Question of the Necessity of a Second Operation for the Removal of the Appendix in Cases of Appendiceal Abscess Treated with Simple Incision and Drainage," by Dr. Stuart McGuire, of Richmond, Va.

Discussed by Drs. Guerry, Richardson, Hill, Carr, Noble, Winslow, Ochsner, Mayo, Murphy, Cunningham, and in closing by the author.

14. "Resection of the Bowel, with a Report of Eleven Cases," by Dr. J. Shelton Horsley, of Richmond, Va.

15. "Bowel Obstruction and its Treatment," by Dr. T. C. Witherspoon, of Butte, Montana.

These two papers were discussed together by Drs. Brown, Seelig, Whitacre, Tuholske, and in closing by the essayists.

On motion, the Association adjourned until 2.30 P.M.

Afternoon Session.—The Association reassembled at 2.30 P.M., and was called to order by the President.

On motion of Dr. R. M. Cunningham, the courtesies of the floor were extended to Dr. G. Frank Lydston, of Chicago.

16. "Penetrating Wounds of the Abdomen," by Dr. F. W. McRae, of Atlanta, Georgia.

Discussed by Drs. Sherrill, Guerry, Winslow, Caldwell, Hendon, Rosser, Brown, and in closing by the essayist.

17. "Rare Forms of Hematoma," by Dr. J. Garland Sherrill, of Louisville, Ky.

Discussed by Dr. Carr.

18. "Hypoplasia in its Relation to Disease," by Dr. Charles P. Noble, of Philadelphia.

19. "Surgery of the Pleura," by Dr. John B. Murphy, of Chicago.

Discussed by Drs. Rosser and Sherrill.

20. "A Consideration of the Mortality in One Thousand Operations for Goitre." by Dr. Charles H. Mayo, of Rochester, Minn.

21. "Observations on the Surgical Treatment of Exophthalmic Goitre, by Dr. John R. Wathen, of Louisville, Ky.

These two papers were discussed conjointly by Drs. Horsley, Tuholske, Porter, and in closing by the essayists.

22. "Surgery and Neurasthenia," by Dr. Charles M. Rosser, of Dallas, Texas.

At this juncture the President appointed to fill four vacancies on the Council, Drs. F. W. McRae, I. L. Watkins, Bacon Saunders, and L. C. Bosher.

On motion of Dr. Smythe, the Association then adjourned until Thursday.

THIRD DAY.—*Thursday, December* 17, 1908.

Morning Session.—The Association met at 9.40 A.M., and was called to order by the President.

23. "Operative Treatment of Tuberculous Joints," by Dr. Horace J. Whitacre, of Cincinnati.

Discussed by Drs. Caldwell, Ochsner, Hendon, Rosser, and in closing by the essayist.

24. "Splenectomy for Splenomegaly of Doubtful Classification," by Dr. M. C. McGannon, of Nashville, Tenn.

Discussed by Drs. Carr, Horsley, Hendon, and in closing by the essayist.

The Secretary read the following unsigned telegram from Dr. Bull: "Dr. Bull presents his compliments to the members of the Southern Surgical Association, and thanks them for their good wishes."

The President asked the Auditing Committee whether it was ready to report at this time or not.

Dr. Cunningham reported that the Auditing Committee had examined the books and vouchers of the Secretary and Treasurer, and had found them correct, the report being signed by the members of the Committee.

SECRETARY'S REPORT.

To the Officers and Members of the Southern Surgical and Gynecological Association:

The following is a statement of the collections and disbursements of the funds in the Secretary's hands:

RECEIPTS.

December 14, 1907, balance in bank	$450.15
December 12, 1907, to December 12, 1908, dues received	1920.10
August 28, 1908, interest on deposit	30.27
November 5, 1908, interest on deposit	9.78
Total	$2410.30

DISBURSEMENTS.

December 14, 1907, certified check to C. M. Rosser for bank balance	$450.15
December 19, 1907, Wm. Whitford	50.00
November 5, 1908, Stuart McGuire, Treasurer	1890.15
December 11, 1908, balance in bank	20.00
Total	$2410.30
There remains uncollected from members	320.00

Respectfully submitted,
W. D. HAGGARD.

On motion, the report was adopted.

The President asked for the report of the Council at this time, which was read by the Secretary, as follows:

REPORT OF THE COUNCIL.

The Council unanimously makes the following recommendations:

1. That the amendment to the By-laws introduced at the last meeting by Dr. Le Grand Guerry, that in Article X the words "and shall not be eligible for re-election," follow the words "shall be elected annually to serve five years," be passed.

2. That the resignations of Drs. James D. Bullitt, of Louisville; Robert W. Johnson, of Baltimore; Arpad G. Gerster, of New York; W. P. Manton, of Detroit; Charles Oviatt, of Oshkosh; Howard J. Williams, of Macon, Georgia, be accepted.

3. That the deaths of ex-Presidents Richard Douglas and A. M. Cartledge be sorrowfully recorded and suitable memoirs be published in the TRANSACTIONS.

4. That the four names of delinquent members recorded in the books of the Association be dropped from the roll of membership.

5. That the total of thirteen vacancies be filled by the following applicants:

Dr. Frank J. Lutz, St. Louis, Mo.
Dr. Ernst Jonas, St. Louis, Mo.
Dr. V. P. Blair, St. Louis, Mo.
Dr. James S. Irvin, Danville, Va.

Dr. Robert C. Bryan, Richmond, Va.
Dr. Reuben Peterson, Ann Arbor, Mich.
Dr. William Wood Russell, Baltimore, Md.
Dr. R. C. Coffey, Portland, Oregon.
Dr. F. Gregory Connell, Oshkosh, Wis.
Dr. Richard Barr, Nashville, Tenn.
Dr. Gaston Torrence, Birmingham, Ala.
Dr. Irving Abell, Louisville, Ky.
Dr. Joseph A. Crisler, Memphis, Tenn.

6. That the attention of the members be especially called to Article IX of the Constitution. "Any member who for three consecutive years fails to attend the meetings or present a paper shall be dropped from the roll of membership." (This goes into effect at the next meeting.)

7. The Council further recommends the following as officers for the ensuing year:

President, Dr. Stuart McGuire, of Richmond, Va.

First Vice-President, Dr. John Young Brown, of St. Louis, Mo.

Second Vice-President, Dr. R. S. Cathcart, of Charleston, S. C.

Treasurer, Dr. Wm. S. Goldsmith, of Atlanta, Ga.

For the Council to fill the vacancy caused by the expiration of service, as well as the death, of Dr. Richard Douglas, Dr. Bacon Saunders, of Fort Worth, Texas.

8. That the next place of meeting be at Hot Springs, Va., and that Dr. Lewis C. Bosher be requested to act as Chairman of the Committee of Arrangements.

All of which is respectfully submitted,

F. W. Parham,
President ex-officio,
L. S. McMurtry,
Floyd W. McRae,
Lewis C. Bosher,
Bacon Saunders,
I. L. Watkins,
W. D. Haggard.

On motion of Dr. Horsley, the report of the Council was adopted as read.

The President appointed Drs. Horsley and Ochsner to escort the President-elect to the platform.

The retiring President introduced his successor with

the following words: "It gives me great pleasure, as I know it gives to this Association, to introduce my successor, Dr. McGuire. It is unnecessary for me to say anything in regard to his ability to conduct the deliberations of this body, and I cheerfully surrender the position to him." (Applause.)

Dr. McGuire said: "Gentlemen, when two months ago I was elected President of my State Association, I thought my cup was full. Today it runs over. When I recall the names of the illustrious men who have preceded me in this office, beginning with my father, and ending with my friend, Dr. Parham, I realize the dignity and responsibility of this position and my own unworthiness to fill it properly; but I assure you all that I shall do my best for the advancement of the interests of this Association." (Applause.)

On motion of Dr. Rosser, all papers received by the Secretary, but read before the Association, be read by title and published in the TRANSACTIONS.

25. "Fibroid Tumors in Pregnancy," by Dr. Charles L. Bonifield, of Cincinnati, Ohio.

Discussed by Drs. Hill, Hall, Smythe, Hunner, Coffey.

26. "Scrotal Elephantiasis of the Male Genitalia, with Report of Cases," by J. N. Baker, of Montgomery, Alabama.

Discussed by Dr. Doughty.

27. "Report of an Accident to an Infant Seventeen Months Old, with Extensive Injury to the Abdominal Wall and Evisceration of all Small Intestines, with Recovery," by Dr. Rufus B. Hall, of Cincinnati.

Discussed by Dr. Davis.

28. "Temporary Ventrosuspension of the Uterus, Its Indications, Technique, and End Results," by Dr. Edward H. Ochsner, of Chicago.

Discussed by Drs. Coffey, Davis, Byford, Hall, Elbrecht, Carr, Polk, and in closing by the essayist.

On motion, the Association adjourned until 2.30 P.M.

Afternoon Session.—The Association reassembled at 2.30 P.M., and was called to order by President McGuire.

29. "Report of a Successful Operation for Vesico-uterine Fistula, with Loss of Function of the Vesical and Urethral Sphincters," by Dr. R. S. Hill, of Montgomery, Ala.

Discussed by Drs. Smythe and Hall.

30. "Surgical Treatment of Epilepsy," by Dr. Wm. P. Carr, of Washington, D. C.

Discussed by Drs. Davis, Lydston, and in closing by the essayist.

31. "Vaginal Hysterectomy for Carcinoma of the Uterus," by Dr. Henry T. Byford, of Chicago.

Discussed by Drs. Polk, Hall, Smythe, and in closing by the author.

32. "Cancer of the Parotid, with a Report of Five Cases," by Dr. George A. Hendon, of Louisville, Ky.

Discussed by Drs. Smythe, Gavin, and in closing by the essayist.

33. "Abdominal Aneurysm Treated by Wiring, with Report of a Case," by Dr. A. M. Willis, of Richmond, Va.

Discussed by Drs. Carr, Davis, and in closing by the essayist.

34. "False Aneurysm of the Femoral Artery following Typhoid Fever, with Report of a Case," by Dr. R. S. Cathcart, of Charleston, S. C.

35. "The Transverse Abdominal Incision," by Dr. S. M. D. Clark, of New Orleans, La.

Discussed by Drs. Davis, Hendon, Cannaday, Elbrecht, McGannon, Hall, Frank, and in closing by the essayist.

36. "Physiological and Anatomical Restoration *versus* Removal of the Internal Generative Organs of Woman," by Dr. John E. Cannaday, of Charleston, S. C.

Discussed by Drs. Byford, Hall, and in closing by the essayist.

On motion of Dr. R. M. Cunningham, the thanks of the Association were extended to Dr. John Young Brown, Chairman of the Committee of Arrangements; to the local members of the medical profession, for the splendid arrangements made and which contributed so much to the success of the meeting; to the management of the Planters' Hotel for courtesies extended, and to the officers of the Association for the faithful discharge of their duties.

There being no further business to come before the meeting, on motion, the Association adjourned to meet at Hot Springs, Va.

WILLIAM D. HAGGARD, M.D.,
Secretary.

The Association does not hold itself responsible for the views enunciated in the papers and discussions published in this volume.

W. D. HAGGARD, M.D., *Secretary*,
NASHVILLE, TENN.

ADDRESS OF THE PRESIDENT.

CONSERVATIVE SURGERY, THEN AND NOW.

By F. W. Parham, M.D.,
New Orleans, Louisiana.

I confess to much embarrassment in complying with Article VI of the By-laws: The President shall deliver an annual address at each meeting of the Association. The example of my distinguished predecessor had raised the standard of the presidential address so high that I was thrown into confusion. Lord Nelson, on going into his famous sea fight, raised the signal, "England expects every man to do his duty." So, every loyal member of this Association ought to find his pleasure in responding to the call of duty; thus reflecting, I brought myself into a calmer state of mind and began to cast about to find how I might most properly comply with your mandate.

The richness of our programs urged me not to trench upon the privileges of the floor, and so I sought some topic of general interest that might not too greatly tax your patience. I shall beg your kind indulgence while I talk to you in, I confess, a rather desultory way on Conservative Surgery, Then and Now.

I have long been dominated by the feeling that we have not fairly appraised the achievements of the past, but have rather lent too ready an ear to the alluring claims of novelty. Novelty has too often been confused with progressiveness, and

progressiveness has been used too often synonymously with aggressiveness. The aggressive surgeon who always feels sure he's right then goes ahead would do well to temper the enthusiasm born of the present brilliant achievements of surgery by giving reverent heed to the admonitions of the past.

A recent writer has published the following strictures upon hospital surgeons: "Modern aggressive surgery has made the hospital into a hotel for the temporary care of the vivisected. All that the surgeon cares for is a room for his patient to occupy during the three or four weeks she is recovering from his incisions. She may then go home and get well or lead a life of invalidism, as it happens. To cure his patient and restore her to a life of usefulness and happiness is not the modern surgeon's conception of duty." No fair-minded surgeon will endorse such unjust criticism, yet most of us are ready to admit that more conservatism is needed and that the growing tendency to regard surgery in its totality as operative must be combated. While I do not agree with the distinguished President of the American Surgical Association when he said in his address last spring that an operation was a confession of failure, I do believe that the surgeon who regards no case as worthy of consideration that does not offer an opportunity for the display of his surgical skill must be counted as not making the most of the brilliant advances in diagnosis and treatment of modern times. We have mostly emancipated ourselves of the superstitions of the past, but are we sure that we are not really retarding the advance of surgery by yielding too readily to the seductive arguments of radicalism? In the past did not enthusiasm sometimes outstrip reason and prudence? Witness the mania for bloodletting in France, whereby under the influence of Broussais and his followers no less than 41,000,000 leeches were imported into France in the single year of 1833, when people were bled lying down in order that they might not faint before sufficient blood had been withdrawn—and yet Broussais was called by

some a Messiah of medicine. And was not *he* considered the most skilful surgeon who could do the most brilliant operation? In pre-anesthetic days time was a factor of the greatest importance; quickness was essential to the safety of the poor sufferer. Many unnecessary amputations of the last century are to be attributed to this, and the success of the great Liston over his opponents in the famous controversy over the value of the flap amputation of the hip well illustrates how a whole nation may blindly follow a great leader who has the courage of his convictions.

Yet men soon came to their senses and began to ask whither they were drifting. In the squabble over the best method of amputation the main question had been lost sight of: Was amputation at all required? Could not life be saved and the limb also saved? When John Hunter asked, might not, for the cure of popliteal aneurysm, the artery be tied where amputation would cut it, and, having answered it in the affimative, put it into practice on a patient, was not the surgical world aghast for a time? Yet Hunter prevailed, and his proposition was afterward pronounced one of the great conceptions of surgery. Men began to think under the stimulus of John Hunter's brilliant work. But progress in conservative surgery was slow. Its dawn began with Sir Benjamin Brodie, as related by Sir William Fergusson, who introduced the expression conservative surgery into practice. In the *Medical Times and Gazette,* 1852, Sir William writes: "The grand object of surgery, properly so called, may be defined, aphoristically, to be the preservation of the greatest portion of the body at the smallest possible sacrifice." He relates: "In 1824 Sir Benjamin Brodie amputated a leg for painful disease in the lower end of the tibia of twelve years' duration, which had resisted all treatment." He was wise enough to examine the amputated leg, and found an abscess of the size of a chestnut at the seat of pain. Three years later, in a similar case, he applied a trephine, evacuated the pus, and cured his patient. She was still cured nineteen years later. Can any-

one say that the one operation was less curative, less radical, than the other? The amputation may have been more spectacular, but the other was more commendable in conception and result.

Such operations, said Fergusson, are to be classed "among the most brilliant of modern surgery." The observation of Sir Benjamin Brodie marked an epoch in bone surgery and, indeed, in surgery in general. Excisions and resections of bones and joints took the place of amputation, and surgeons began to be distinguished more by the number of legs and arms saved than by their rapidity in amputation.

How far in advance of Sir Benjamin and Sir William is modern bone surgery is well displayed in the admirable article of Nicholls, of Boston, on the "Pathology and Treatment of Osteomyelitis," read at the New Orleans meeting in 1903 of the American Medical Association. As the result of such thorough investigations surgeons are beginning to learn the value of timely diagnosis of the true cause of the fever of osteomyelitis, which has parted company with rheumatism and typhoid fever, so long the cause of diagnostic stumbling.

Your President in 1899 said in his address that true conservatism versus radicalism was one of the important problems for the twentieth century to solve. Happily, safer anesthesia, saner asepsis, and sounder instruction in surgical pathology and diagnosis are making often the most radical surgery the most conservative, and the most conservative surgery the most radical, if by radical we mean the thorough eradication of disease. The modern methods of diagnosis, including all sources of information, from the careful study of the history of a case and its clinical manifestations, ending with the investigation of the blood and the body secretions and evacuations and the illumination of the cavities and tissues with electric light and x-rays, have helped us to locate more definitely the seat of the pathological process and to localize and restrict our operative attack.

In renal surgery, for example, conservative and radical

surgery display most conspicuously their coincidence. Here results demonstrate that often the most conservative treatment is also the most radical. As witness of this, what could be more striking than that case of Bransford Lewis' in which by means of the styleted ureteral catheter and radiographic plates he found three independent ureters, two of them healthy, the third showing gonococcal infection, "the cause of a recurrent gonorrhea of five years' standing. Through the means mentioned, the anatomical anomaly was demonstrated, the physiological phenomenon of supplying three different urines by one individual was proved, and through medicated lavage of the infected ureter the source of infection was removed and the patient permanently relieved." That stricture of the ureter, giving rise to renal destruction, might not only be diagnosticated by ureteral catheterization during life, but actually relieved by incision through the cystoscope or dilatation with ureteral sounds, has been demonstrated over and over again. Notwithstanding these brilliant achievements of the cystoscope and ureteral catheter, we still hear the remarkable advice given to determine the relative value of two diseased kidneys by exploratory nephrotomy and renal palpation. Again, while we may make a diagnosis of renal or bladder stone by the symptoms and urinary examination alone, still the advantage of employing all aids of clearing up our diagnostic doubts is shown by the glaring blunders sometimes committed, which might have been prevented by resort to cystoscopic and radiographic investigation and other means of diagnostic precision.

The case reported by Seelig of an appendical coprolith with ureteral adhesion, which had caused ureteral obstruction, demonstrated by ureteral catheterization, and shown by the radiographic plate to be due to stone, the real nature of the case only being disclosed by laparotomy, does not in any sense detract from the value of ureteral exploration and radiographic diagnosis. These, like the findings of the microscope, are only data furnished us; the determination of their significance

lies within the domain of our reason and judgment. The instruments did not lie, they were only (mute) witnesses of a pathological process, which the use of the knife interpreted properly.

The glory of the present day surgery, then, rests primarily upon more accurate diagnosis, but the refinements of scientific investigation must always be subjected to the criticism of common sense. Douglas Powell well expressed the sentiment I have in mind when in his recent lecture delivered before Guy's Hospital Physical Society he said: "There never was a period when we could see so minutely into disease as we can now, and as time advances our vision will become still more penetrating; it behooves us the more to preserve the range and proportion of things lest this finer insight may but enable us 'with finer optics t'inspect a mite not comprehend the heav'n.' The brilliant and penetrating searchlights—microscopic, radiographic, ophthalmic, aurolaryngo-spectroscopic, sphygmographic, cardiographic, not to mention electrophonic and other methods—must be used with discretion and not a little forbearance." All the defects of which we become aware, he says, must not be taken too seriously, but all our data acquired from every source must be duly weighed and put into their proper diagnostic relation before any plan of treatment is laid out. Only thus, by placing the facts in proper relation, may we hope to get a picture in true perspective of the disease. Only thus may we realize the hope of the old Latin author, Felix qui potuit rerum cognoscere causas. Only thus may we select the most conservative and in many cases the most radical treatment for the case.

The establishment at Cambridge of a committee for the study of special diseases, composed partly of men engaged in practice and partly of those engaged in research, is an important step in the right direction, and this is an example, as Powell says, which our great hospitals might follow by the establishment of a research ward for the clinical investigation of chronic maladies, in order to bring into line all the technical

and other factors of diagnosis and treatment, which must be comprehensible to the practising physician before they can be considered of real value.

It is becoming more and more characteristic of the modern surgeon that, while recognizing the value of data furnished him by the laboratory, he will relentlessly subject them all to the test of reason and will only decide upon his surgical therapeusis when, after a thorough study of all the facts, he has obtained a true perspective of the case. When he shall have done that he must realize that he is but the handmaid, not the master of nature. He will become conscious that he is not to take the place of the vis medicatrix naturæ, but to assist. Without this vis medicatrix he can do nothing, for when we have made a wound, can we make it heal if the power of healing is not there? He removes the cause of disease and closes the wound gently and reverently, doing no violence which might interfere with the full exercise of nature's power. Then he waits and watches in full confidence of the result, believing that nature is only uncertain and capricious when she is abnormal. When properly assisted back to her normal province she doeth all things well. We are the bunglers, because we often do not understand her ways. We are emerging, as Robert Morris has remarked, from the pathological into the physiological era in surgery. The valuable discoveries of Metchnikoff and Wright of phagocytosis and opsonins have emphasized the necessity of conserving the natural resistance of the patient, on which Lister laid so much stress even before antiseptic gave place to aseptic surgery. The surgeon who respects the power of nature will do only the least needed to set nature right. He will become really a conservative surgeon, his first object being to save life, his second to leave his patient as nearly as possible in the image in which he was created. He will do as much as may be required, but no more. He will be as radical as may be required, not reckless, and hence conservative. He will take advantage of the factors of safety of the human machine, as Meltzer

has pointed out, and will allow the therapeutics of self-repair to have as far as possible command of the situation. No better illustration of my meaning could be given of the true conservative surgery which saves life with the minimum effective interference than Murphy's management of general peritonitis from ruptured appendix, or that proposition of Cushing's made last year at the meeting of this Society of subtemporal decompressive operations in the treatment of bursting fractures of the cranial base. Any procedure, attended by so little risk, that can reduce the mortality from grave cerebral traumatism from over 50 per cent. to 13⅓ per cent., as in Cushing's hands, must surely be placed among the conservative life-saving operations; yet most of us have been satisfied with the do-nothing policy—content to let these unfortunates die victims of a policy of masterly inactivity. Happily, this and other life-saving procedures have removed many of the opprobria of surgery and placed the surgery of this age of medical enlightenment in such marked contrast with the practice of Ætius, of the sixteenth century, who was such a good Christian Scientist that he recommended one of the following formulas for the extraction of a bone from the throat: "Bone, as Jesus Christ caused Lazarus to come forth from the sepulchre, as Jonah came out of the whale's belly, come out of the throat," or, "Bone, I conjure you by Blaises, martyr and servant of Jesus Christ, come forth or go down."

Anesthesia and asepsis and improvements in surgical technique have made possible a modern surgery that would have been simply astounding to men of the time of Fergusson, Brodie, Liston, and Syme. "No man," as Mumford has well said, "has reckoned the immeasurable saving of life, the incomputable relief of suffering, the opening of new surgical fields." So safe, under the protection of anesthesia and asepsis, has become our operative attack, that "daring has become conservatism, rashness has become common sense." But in nothing will be more conspicuous the advance of the future than in the development of conservative surgery.

When Hunter tied the superficial femoral artery he did a great act of conservative surgery, but when under the protection of the Esmarch bandage the modern surgeon enters boldly the aneurysmal sac itself, searches for the feeding vessels, and sutures their mouths, after the technique of Matas, he does at once a radical, and yet a more conservative, operation than the Hunterian, because he imitates more closely nature's mode of cure. With the possibilities opened up by the marvellous work of Carrel, Guthrie, and others in vascular surgery, no man can set a limit to the progress of the future in conservative surgery. The wonderful results of Bier's hyperemia treatment, the great advance in stomach and intestinal surgery, the surgery of the heart and lungs and kidneys would seem now like a fairy tale to old Dupuytren, the Napoleon of French surgery, who, suffering from an empyema, refused operation, saying he would rather die by the hand of God than by the hand of man.

What is more striking than the shock-blocking effect of the intraneural or intraspinal injection of cocaine, or the rapid resuscitation by transfusion of blood of a patient dying of acute blood loss? I will not weary you by enumeration of the many triumphs of modern surgery. One field is only partially tilled—much has been done, but much remains to do, for cancer yet remains the opprobrium of surgery. Here conservative surgery has small place. The only conservatism that avails is to have the general practitioner send the case in time. Taken early, we feel hopeful of a large percentage of cures, but the late cases are often beyond our aid. The address of Crile before the surgical section of the American Medical Association last June aroused great enthusiasm and raised hope high that an early diagnostic test and a cure of cancer was about to be discovered in the hemolytic reaction of cancer serum and the prophylactic effects of transfusion of normal blood. Weil has recently, as a result of his own investigations along these lines, raised some doubt concerning the value of these tests, but Crile's work has been so painstaking

and his promises hitherto so cautious that we shall not abandon hope. Surely this is one of the greatest problems pressing for solution, and the man or men who can find some means of staying the progress of this wholesale destroyer of human life will merit the gratitude of the human race.

I have not pretended, gentlemen, nor have I intended, to give in the foregoing remarks anything more than a mere cursory glance at past or present-day surgery. If I have in a feeble way but thrown out food for thought I shall be content. The noblest study of mankind is man. Let us continue to try to prolong man's life until old age shall cut him down, and let us preserve him so far as possible in his God-like form. Let us do the least required of us as surgeons to accomplish the most. In these days of "wolfish hunger after knowledge" no limit may be placed upon the possibilities of the surgery of the future. Already many affections have been removed from the province of the internist to that of the surgeon, who now saves life or cures disability where death or chronic invalidism was the rule. No wonder, then, the surgeon is accused of cacoëthes operandi. Enthusiasm must have some check. While no man may prescribe a limit to the development of operative technique, let us not forget that our patients have a right to demand of us the best result. We should strive to save life, but the minimum of damage should be our aim. If we make it a rule to find out everything possible about our patient before we operate, we shall operate only when necessary and shall reduce our operative attack to the minimum, doing the work thoroughly but quickly. While we may aspire, as John Collins Warren remarks, "to add to modern skill the speed of a former generation," we must remember that speed, not haste, is what we need. Moynihan neatly expressed it when he said, "Speed should be the achievement, not the aim of the operator." With these precepts constantly in mind, the operator will seek only the good of his patient, not the enhancement of his own reputation. By correctly estimating the powers of our patient, avoiding all officious

meddling, doing well, but quickly, only what must be done, having, as Sir James Paget expressed it, "the courage to do little" when more would be harmful, having always in mind, first and foremost, the cure of our patient, we shall best serve mankind and preserve our art from stain. Now we see the dying words of Goethe being realized—Mehr Licht. Let this be our watchword:

"Strong in will,
To strive, to seek, to find, and not to yield."

SYPHILITIC HYPERPLASIA OF BONE.

By C. E. Caldwell, M.D.,
Cincinnati, Ohio.

That syphilis in either its early or late stages is a cause of bone disease is a matter of common observation.

Syphilitic osteomyelitis, diffuse osteoperiostitis, and localized subperiosteal granuloma (gumma) are too familiar conditions to warrant mention.

The object of this short paper is to call attention to what may perhaps be called a pathological condition rather than a definite disease.

This condition is characterized by the deposition, without apparent coincident inflammatory symptoms, of bony substance from the osteogenetic layer of the periosteum. When occurring in the long bones, particularly in the tibia, it results in overgrowth or a species of gigantism of the affected bone.

Occurring, as it frequently does, in the metaphyses or epiphyseal ends of the long bones, it may, through juxtaposition to a joint, be mistaken either for tuberculous epiphysitis, or, as in one case, the skiagram of which I herewith present, may closely simulate in its clinical history and appearance a myeloma or giant-celled tumor of the epiphysis.

Fortunately, in the Röntgen rays we have a very satisfactory means of differential diagnosis, and we are usually rewarded with a picture which quite definitely classifies the condition.

The class of cases to which I refer have usually a remote and not always clearly defined history of syphilitic infection.

The progress of the affection is so gradual and accom-

panied by such slight disturbance of the comfort of the patient that he does not usually present himself for treatment until the bony overgrowth is such as to attract his attention.

Pain, if present, is not elicited by pressure, as in ordinary gummatous periostitis, and is often more pronounced when the patient is at rest than when he is actively engaged. It is this feature in particular that arouses suspicion as to the syphilitic origin of the disease. Occasionally the nocturnal pain is pronounced enough to disturb the patient's rest.

The condition, so far as I have observed, shows no tendency to those retrogressive changes resulting in osteoporosis or breaking down of the affected area.

Inasmuch as the cases which have come under my observation have not undergone operation, but have more or less promptly, that is, in a period varying from six weeks to three months, yielded to treatment with iodide of potassium in large doses with local inunctions of mercurial ointment, there has been no opportunity for pathological histological investigation.

Inferentially from the *x*-ray pictures, there is a formative osteitis of an extremely chronic form, which may not inaptly be compared to the chronic interstitial hyperplasia of internal viscera, and to the syphilitic hyperplasia of the coats of arteries resulting in obliterating endarteritis. It is not at all improbable that in the class of cases to which I refer there may be nutritive changes in the periosteum which produce a condition not dissimilar to leontiasis, or to Paget's disease. In one case affecting the lower end of the tibia the tumor was so circumscribed and had grown so large as to have deceived certain surgeons into the belief in its sarcomatous or myelomatous nature.

In this case, a man, aged thirty-four years, in whom there were found no stigmata of syphilis, a history was elicited of a sore which had been contracted seventeen years before, although there was no history of secondary mischief. A diagnosis of syphiloma or formative osteoperiostitis was

made and confirmed by *x*-rays. Iodide of potassium in large doses has cured the patient in three months.

In another case, a negro on my service at the Cincinnati Hospital, had such enlargement of the lower end of the tibia as strongly to suggest tuberculosis of the lower epiphysis. Iodide of potassium in this case showed the true nature of the condition in a very short time.

Whether these cases would not in time show retrogressive changes, breaking down of bone, which would place them in the category of gummatous osteoperiostitis, I am not prepared to say, but from observation of a number of such cases I am inclined to believe that syphilis may develop a condition in bone which is similar to interstitial lesions in the viscera and arteriosclerotic changes in the vessel walls. The overlying skin and soft parts in this class of cases do not appear to be involved.

That I am justified in assuming that these cases of hyperplasia differ in nature from the generally recognized forms of gummatous osteoperiostitis, I am not prepared to assert definitely, but that they certainly differ in degree and intensity from such cases, and are by reason of their extreme chronicity capable of being confounded with other forms of epiphyseal disease, is the excuse for this brief reference.

DISCUSSION.

Dr. Arthur Dean Bevan, of Chicago.—I should like to say a few words in regard to this interesting presentation. I think it is timely and very proper that we should be repeatedly reminded of the fact that there are syphilitic granulomas that produce tumor-like masses of the bones which are very apt to be mistaken for sarcoma. I know this has been called to my attention in a number of instances. I think you are all very familiar with the classical paper of Esmarch on this same point, in which he discusses the general subject of sarcoma and syphilitic lesions, and the effect of the antispecific treatment in connection with them.

I have personally had such an experience as this of a man brought to me by a good practitioner, with a diagnosis of sarcoma of the thigh, the clinical picture being quite definite of sarcoma of the thigh, the patient, the father of four or five healthy children, denying absolutely any history of syphilis, and when informed that an amputation at the hip-joint was necessary, was quite willing to submit to the operation. Fortunately, before doing this extensive operation, massive doses of iodide of potassium were employed for a few months, with entire disappearance of the tumor; and then the patient, as occasionally happens in such cases, confessed to a syphilitic lesion long before he was married, making the statement that he had not made known this before because he was so confident that there could be no connection between that initial lesion and the present condition. As I have said, he was perfectly willing, when told that amputation of the thigh was necessary, to submit to that operation.

There is one point in the pathological histology which I should like Dr. Caldwell to clear up, and that is this: I should be quite willing to agree with him that the skiagraph is distinctly that of a syphilitic lesion, but how can he differentiate between the ordinary gummatous lesion and its results, which is so common, and this so-called hyperplasia? I am not quite so clear about this point, and I would ask him his differential diagnosis.

Dr. Caldwell (closing).—In answer to Dr. Bevan's question, I will say that I made this diagnosis inferentially from a clinical experience of a number of cases in which we have had the peculiar condition I have referred to. In the other picture you will observe that there is new bone under the periosteum without the involvement of the overlying skin where the bone is superficial. In ordinary gummatous periostitis of the more common types, we will have infiltration and a thickening round about; there is oftentimes discoloration going on in the skin thereabouts. The clinical history is more of an acute condition than in the cases I described. This case went on for a period of years, before he came to me for diagnosis. Whether I am right in my surmise or not, I am not prepared to state definitely, but the object of the paper was to call attention to the fact that these slow overgrowths of bone are very likely to be

due to syphilitic lesions when a history can be elicited of a former infection.

Then, again, with regard to confounding the condition with sarcoma, I will say that the *x*-ray picture in sarcoma is much more homogeneous; there is a homogeneous breaking of the *x*-rays rather than an uncertain, indefinite, irregular outline we find in these syphilitic lesions. I am perfectly willing to admit that my attitude is susceptible to criticism, but I believe, if we pay more attention to these cases, and examine them all with the *x*-rays, there will be fewer errors made.

Night before last, in reading Bloodgood's article in *Progressive Medicine,* I noticed he called attention to the very great liability of confounding overgrowths of bone of this nature with sarcoma.

MYOMA AND MYOSARCOMA OF THE STOMACH.

By James E. Thompson, M.D.,
Galveston, Texas.

The following case of benign tumor of the stomach came under my observation a few months ago, and it presented features of such interest that I felt it wise to report it in extenso. On referring to the literature on the subject, I found such an interesting mass of facts that I thought it would be interesting to elaborate them and attempt to get order from chaos.

Mrs. I. A., aged forty-two years, came under my care on July 4, 1908. The history of the case is as follows: Four years before, during the fourth pregnancy, she suffered from a fainting spell, which was followed by black, tarry stools. Eight months later another fainting spell occurred, which was accompanied by the vomiting of a washbowlful of fresh red blood clots, and was followed by collapse and unconsciousness. After this the stools were black and tarry for a few days. Since this time the fainting spells have occurred at irregular intervals, from six to eight months apart, and in every case have been followed by the passage of tarry stools. After each attack she was very weak and suffered from anemic dyspnea.

Between the attacks the stools were natural in color and contained neither blood nor mucous. During the attacks she complained of no pain, but between them from time to time she suffered from slight pain in the epigastrium. During the last year pains in the epigastrium have been fairly constant, coming on three or four hours after food and lasting for

about half an hour. Occasionally these pains are relieved by eating a little more. Cereals and bread give her a bloated feeling. Milk causes acute distress and eructations of gas.

Lately she has been suffering from neuralgic pains in the legs and arms. These are particularly troublesome at night, and are relieved by getting up and walking about.

One attack began with acute cramps in the arms and legs, and lasted from ten o'clock at night until four o'clock in the morning. She was almost in a state of collapse and was bathed in perspiration. The cramps in the limbs are never associated with pain in the epigastrium, but there is always distention of the stomach and eructations of gas. They are always followed by soreness in the limbs, especially in the hips and thighs, which lasts for a few days. The cramps seem to be brought on by overexertion.

Emaciation and anemia have been progressive.

Present Condition. Patient is a thin woman weighing about 115 pounds. Her complexion is sallow, but no jaundice can be observed. She is able to walk about, but is easily fatigued.

Examination of the abdomen revealed a flat abdomen, with no distention visible anywhere. No tumor could be detected nor was the stomach dilated. There was slight tenderness over the anterior wall of the stomach.

The region of the gall-bladder showed nothing abnormal.

Examination of the stomach contents after a test meal showed: Free HCl, 40; combined HCl, 32; total acidity, 88; total HCl, 72; no lactic acid; a slight amount of mucus; the stools were examined, but no blood was found.

The urine showed nothing abnormal. The patient suffered from a chronic irritating cough and expectorated a little mucus. Examination revealed no tubercle bacilli.

Diagnosis. This was by no means certain. Ulcer of the stomach was probable. On July 6 operation was performed. A median incision was made and the stomach exposed. A large tumor was felt in its cavity, apparently growing from

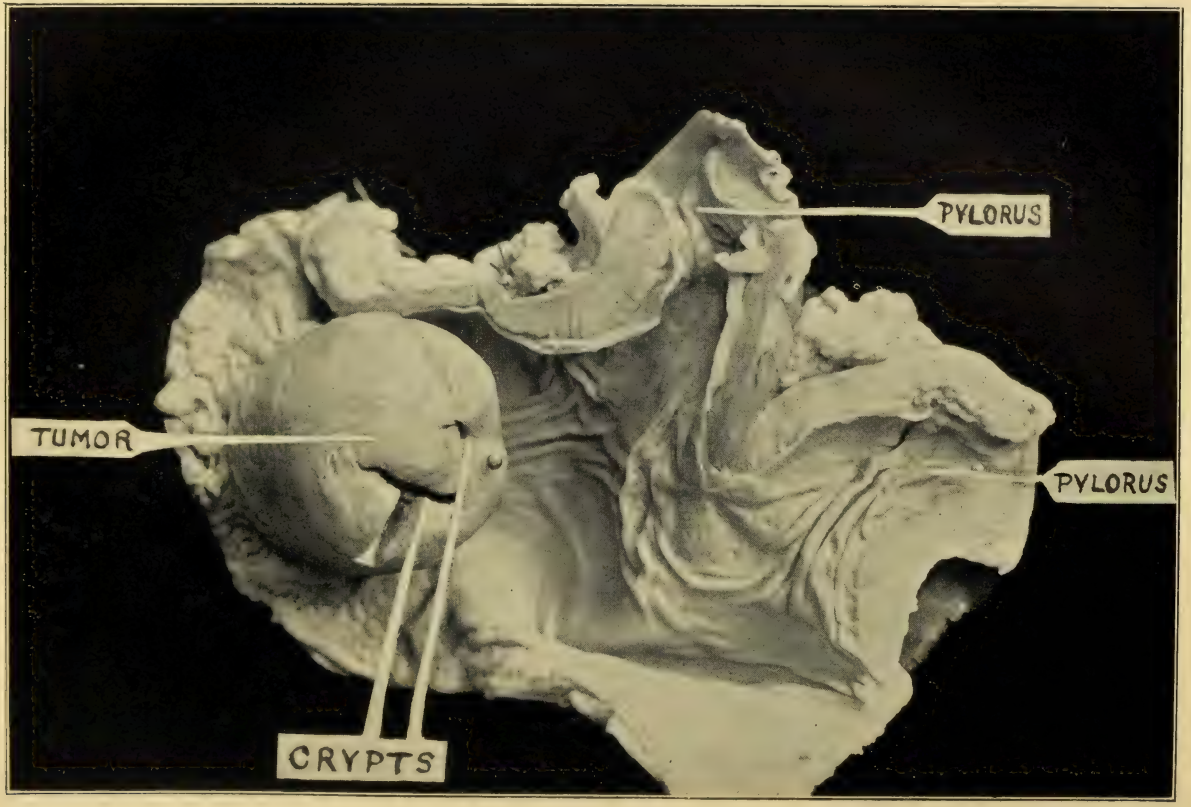

FIG. 1.—Photograph of portion of stomach removed, showing the tumor and the crypts.

Fig. 2.—Camera lucida drawing (high magnification), showing muscular bundles cut transversely and longitudinally.

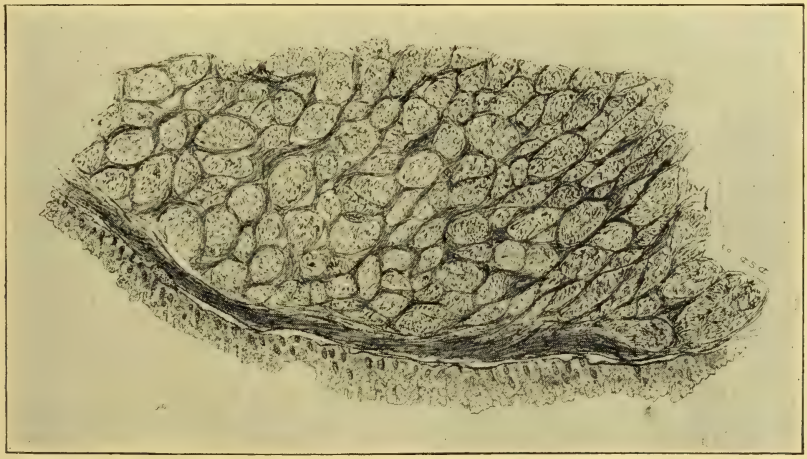

Fig. 3.—Camera lucida drawing (low magnification), showing bundles of muscular fibers, and their relation to the mucous and submucous coats.

the posterior wall. The stomach was not dilated. The pyloric ring and duodenum were healthy. Careful search was made for enlarged glands, but none were found. A partial gastrectomy was decided on, and was performed in the manner described by Binnie as the Rochester method, founded on the second Billroth operation.

The cut ends of the stomach and duodenum were closed, and a posterior gastro-enterostomy performed. So much stomach was removed that there was not sufficient wall left for the application of the anastomosis forceps, so a Murphy's button was used. The opening in the stomach was within an inch of the cardiac orifice, and as the jejunum had to be lifted up to this level, the anastomotic opening was about four inches from its origin. The lines of suture in both stomach and duodenum were reinforced by redundant omentum, which was stitched over them.

Convalescence was very satisfactory. Troublesome bronchial catarrh worried the patient considerably, and had to be relieved by repeated hypodermics of heroin. On the 18th, 25th, and 27th she vomited fair quantities of bile and complained of some distress in the epigastrium, after which she improved rapidly from day to day.

The button was passed on July 31 (twenty-five days after the operation). Probably the button was loose and obstructing the anastomotic opening during the earlier period of distress.

The last report that I have received from the patient states that she is in good health and able to eat anything she pleases and any reasonable quantity. She now weighs 140 pounds.

The pathological report is as follows:

Description of the Tumor (*James J. Terrill*).

Gross Appearance. The growth is situated on the anterior surface of the stomach, about 8 cm. above the pylorus, somewhat nearer the lesser curvature. Arising from a base 4 cm.

broad, it hangs into the cavity of the stomach for a distance of 6 cm., the diameter increasing slightly as it nears the apex or free end. On the lower aspect, about midway, are two puckered or retracted areas. Two others are found on the blunt extremity of the tumor, one of which presents two overhanging lips, causing the whole growth to assume the appearance of a very much hypertrophied cervix uteri as it hangs into the vagina. The tumor is everywhere covered with mucosa, which in most places is quite thin and smooth, but near the base this mucosa becomes thicker and a bit wrinkled. Over the retracted areas mentioned, the mucosa is much thicker and darker. The mass is very firm and cuts with much resistance; the cut surface has a white or slightly pink color, with the peculiar whorled or grained appearance so constantly met in the fibromyomata of the uterus, except in this case the whorls are much smaller and the growth seems finer grained.

Microscopic Appearance. Situation of the tumor in the stomach wall. In the sections taken the tumor is separated from the mucosa only by a thickened muscularis mucosa with some condensed fibrous tissue, which represents remnants of the old submucosa. This places the growth in the muscular coat.

Parenchyma of the Tumor. Here we find interlacing bundles of smooth muscle cells, the cells of each bundle running approximately parallel to each other. This causes the sections to show all transitions from transverse to cross-sections of the muscle cells in each field. The individual cells show large, somewhat rod-shaped nuclei situated in the cytoplasm. These nuclei are irregular in shape, at times drawn out into long, thin rods with blunt ends; again, some are broader, with enlargements along their course or at the ends; some are distinctly oval. The chromatin granules and threads are quite distinct. The sarcous substance is scant.

Stroma. Between the bundles of muscle, and at times mixed in with them, is a fair amount of well-formed adult

fibrous tissue, some of which shows the long dark spindle nuclei. Some of this intermuscular fibrous tissue has undergone a mucoid degeneration, at times the mucoid material being deposited as rounded globules.

Leukocytes. The leukocytic infiltration is by no means marked, and it usually follows the lines of the bloodvessels. Almost all of the leukocytes present are lymphocytes.

Bloodvessels. The blood supply is not great. The vessels have immature fibrous walls, and almost none of them have an arterial character.

Bacteria. Two varieties of bacteria are found in the tumor proper, and both of these are also met with in the mucosa, and both stain by Gram's method. The one is a micrococcus, and occurs only in the lymph spaces and possibly in the capillaries (?), in the part just under the muscularis mucosa. In appearance they are indistinguishable from the pyogenic cocci. The other kind is found all through the sections, even in the deeper parts. They show a special preference for the bands of fibrous tissue; indeed, in places they are piled up in great numbers. As one gets into the muscle bundles, they become fewer in number. They are large, rodded, with square ends, even thicker and longer than most specimens of the Bacillus subtilis. They show an irregular staining, nicely brought out by Loeffler's blue, and while most of them are straight, it is not unusual to find some which are bent at a sharp curve. I am inclined to regard these as some form of putrefying organism, and believe that they were present during the life of the tumor. There is absolutely no inflammatory reaction about either variety of bacteria.

Mucosa. In the mucosa covering the growth the gland tubules are well formed, but much of the epithelium is degenerated. Over the retracted scar-like areas mentioned the mucosa is four or five times thicker than normal. There is absolutely no attempt at invasion by these epithelia or the tubules.

The sections were fixed in formalin, embedded in paraffin,

and stained with hematoxylin and eosin, by Van Gieson's method, by Gram's method, with eosin and polychrome blue, and with Loeffler's blue.

Diagnosis. Fibromyoma of the stomach.

An exhaustive analysis of the published cases shows that tumors of the stomach consisting of unstriped muscle are quite rare, but occur frequently enough to merit serious attention. As it is practically impossible to separate the simple tumors (myomata) from the malignant (myosarcomata), the following remarks are based on a study of both varieties. In all, 62 cases have been found in the literature. Of these, 19 were operated upon, and the rest, 43, were found at autopsies, or are descriptions of specimens in the different pathological museums.

The following lists, which are self-explanatory, contain the cases arranged according to dates. The list of journals from which they are compiled will be given at the end of the article.

1. Cases Submitted to Operation.

Operator.	Date of Operation.	Tumor.	Result.
1. Kosinski	1875	Leiomyosarcoma	Death
2. Rupprecht	1887	Leiomyoma	Death
3. Laroyenne	1889	Myosarcoma	Death
4. Moser	1894	Myosarcoma	Death
5. von Erlach	1894	Leiomyoma	Recovery
6. von Eiselsberg	1896	Fibromyoma	Recovery
7. Capello	1896	Cyst. Myosarcoma	Recovery
8. Nicoladoni	1896	Fibromyoma	Death
9. Herhold	1897	Myoma	Recovery
10. Bland-Sutton	1899	Myoma	Doubtful
11. Ehrenberg	1900	Myoma	?
12. Poirier	1902	Myoma	Recovery
13. Moser	1902	Myosarcoma	Recovery
14. Samter	1902	Myoma	Recovery
15. Delore	1903	Malignant leiomyoma	Recovery
16. Goullioud	1903	Malignant leiomyoma	Recovery
17. Pernice	1903	Myosarcoma	Recovery
18. Ochsner	1905	Myoma and gallstones	Recovery
19. Goebel	1907	Myoma	Death

2. Cases Found at Autopsies or as Museum Specimens.

Reporter.	Date.	Autopsy.
1. Morgagni	1762	Myoma
2. Monro	1811	Myoma
3. Vogel	1843	Myoma
4. Foerster	1858	Myoma
5. Virchow	1858	Myosarcoma
6. Sangalli	1860	Fibromyoma
7. Cornil	1863	Fibromyoma
8. Virchow	1864	Myoma
9. Virchow	1864	Myosarcoma
10. Jean	1875	Myoma
11. Cutler	1878	Myoma
12. Laboulbène	1879	Myoma
13. Pisenti	1883	Adenomyoma
14. Kidd	1884	Fibromyoma
15. Perls-Neelsen	1886	Myoma—6 kilos
16. Niemeyer	1890	Myoma
17. Pernice	1890	Leiomyoma
18. Bouveret	1893	Fibromyoma
19. Cohn	1895	Myoma
20. Borrmann	1895	Myosarcoma
21. Schlesinger	1895	Myosarcoma
22. Hansemann	1896	Myoma
23. Kemke	1897	Myoma
24. Steiner	1898	Myoma
25. Steiner	1898	Myoma
26. Steiner	1898	Myoma
27. Cohen	1899	Myoma
28. Borrmann	1900	Myoma
29. Borrmann	1900	Myoma
30. Caminiti	1900	Myoma
31. Magnus-Alsleben	1900	Adenomyoma
32. Noll	1901	Leiomyoma
33. Miodowski	1901	Myoma
34. Cohn	1902	Myosarcoma
35. Heitz	1902	Fibromyoma
36. Zironi	1902	Fibroleiomyoma
37. Magnus-Alsleben	1902	Adenomyoma
38. Magnus-Alsleben	1902	Adenomyoma
39. Magnus-Alsleben	1902	Adenomyoma
40. Magnus-Alsleben	1902	Adenomyoma
41. Moser	1903	Myosarcoma
42. Max	1905	Myoma
43. Battey	1907	Leiomyoma

It will be seen that 11 non-malignant and 8 malignant cases have been operated upon, the results being 11 recoveries, 6 deaths, and a doubtful result in 2 cases. By placing the doubtful cases among the deaths, the total mortality is 8

which gives a mortality of a trifle over 42 per cent. Of these deaths, five occurred in operations on the simple tumors and three in those on the malignant.

In these cases we find 37 simple tumors (myoma and leiomyoma) and 6 malignant (myosarcoma).

In addition to the above cases occurring in man, I have noted references to two cases found in horses during the autopsy.

It seemed wise to attempt to build up a symptomatology from the published cases. This would have been a much easier task if the histories of all the cases had been more complete. As it happens, the histories of most of the cases are so meagre and wanting in the most important features that they are comparatively useless. Still, a few of the cases are clear and concise, and I believe that the facts gleaned from the heterogeneous mass of reports will prove both interesting and instructive.

Age.	Cases.
Under the age of 30	2
Between 30 and 40	6
Between 40 and 50	11
Between 50 and 60	8
Between 60 and 70	8
Between 70 and 80	6
Over the age of 80	2
Stated to be old people	2
No age stated	17
Total number of cases	62

Of the two cases under thirty, one occurred in a young girl, aged seventeen years, and was a palpable tumor as large as a child's head, the true nature of which was discovered at operation (Moser, Case 1); the other was found at autopsy in a child, aged ten months, and was only the size of a pea (Case 5, reported by Magnus-Alsleben). From these figures the conclusion is irresistible that the affection is one of adult life, rare before thirty and more common after forty.

Sex.	Cases.
Females	25
Males	17
Sex not mentioned	20

It would be unwise to attempt to draw any conclusions from the above figures.

Hemorrhage. This was the signal symptom in the case reported by me, and naturally I expected to find it frequently mentioned in cases showing a similar gross pathology. I found it mentioned in seven cases only, as shown in the following brief extracts:

Kemke: Eight days before admission the patient suffered from severe hematemesis, which was twice repeated during the day. No tumor palpable. The autopsy showed a large tumor 10 cm. long and 8 cm. broad projecting into the lumen of the stomach.

Diagnosis: Myxomyoma.

Borrmann: Illness accompanied by black diarrhea, marked anemia, and edema of the eyelids. Hematomata and petechiæ in skin and subcutaneous tissues. Palpable tumor the size of a child's head to the left of the median line. Day before death several tarry stools, and vomited copious amounts of dark brown crumbs. Death.

Autopsy: Tumor 17 cm. by 10 cm. projecting partly into the lumen of the stomach and reaching between the folds of the great omentum.

Diagnosis: Myosarcoma.

Schlesinger: Frequent vomiting of material often having a coffee ground appearance. Blood demonstrated. A package of tumors palpable in the upper abdomen. Death from sudden collapse.

The autopsy showed a myosarcoma of the stomach.

Moser: Case 1. Patient suffered from exceedingly severe gastric pains; frequently vomited blood. Acid eructations. Felt a mass moving about in the upper abdomen. Operation.

Removal of a tumor from the posterior wall of the stomach. Weight of tumor 1500 grams.

Diagnosis: Myosarcoma.

Niemeyer: Patient was admitted to hospital in an unconscious condition and died. Cause of death was severe hemorrhage from pediculated apple-sized myoma.

Miodowski: The patient from whom the uterus had previously been removed for bleeding due to myoma suffered from pains in the stomach. Six weeks before death symptoms of severe gastro-intestinal infection, associated with tarry stools. High fever for six weeks. Slight increase in size of palpable tumor. Sudden collapse. Death.

Autopsy: A large myoma, 14 cm. long and 12 cm. broad, growing from the great curvature.

Cohn: Patient had noticed a tumor for five years, had suffered from repeated hemorrhages, and had died of hematemesis. Hemorrhages sudden and frequent. Tarry stools. Death from collapse. The autopsy showed a tumor 23 cm. long and 13 cm. wide, arising from the lesser curvature and projecting into the interior of the stomach, which it almost filled.

Diagnosis: Myosarcoma.

It seems, from a review of the above cases, that profuse hemorrhages are liable to occur from tumors of a considerable size, that project into the lumen of the stomach.

Analysis of the Stomach Contents. It is remarkable that so few of the records give an analysis of stomach contents, although from our interpretation of these analyses in ulcer and cancer we should hardly expect anything definite.

The condition of the gastric juice as to the secretion of hydrochloric acid is mentioned so seldom that no information of value can be drawn from the analyses. It was found absent in three cases (Goebel, Schlesinger, Samter), and present in one (Herhold). In Schlesinger's case lactic acid was abundant; in Samter's it was absent.

Pyloric Obstruction. This symptom is mentioned as a definite symptom in three cases only. It is hinted at as probable in a few others. In Pernice's case it is stated that an egg-shaped tumor, 6 cm. long and 4 cm. wide, completely obstructed the pylorus. Carminiti mentions another case where, at the autopsy, a myoma was found at the pyloric orifice, which narrowed the passage so that a pencil was forced through with difficulty.

Presence of a Palpable Abdominal Tumor. This was noticed definitely in 18 cases, with a doubtful reference in 3 more. Of these, as would be expected, an unduly large number occurred in cases subjected to operative procedures.

Association with Myoma Elsewhere. In only three cases was the association observed. Brodowski mentions that in his case a hysterectomy had previously been performed for a bleeding myoma. Samter mentions that his patient had been previously operated upon for uterine hemorrhage. Battey described a similar tumor (myoma) in the descending colon.

The Size of the Tumor. This varied within great limits. As a rule, the largest turned out to be myosarcomata; but that described by Perls-Neelson, labelled a lipomyoma, weighed 6 kilos, and had drawn the stomach deep into the pelvis. Many very small ones are described which seem to have been discovered by chance at autopsies. Magnus-Alsleben described five of these, the smallest the size of a pea, and the largest the size of a bean.

Pathological Features. As to the gross features, one is struck with the fact that some of these tumors grow into the stomach like polypi, while others grow toward the peritoneal cavity. Only in the very earliest stages can they be intramural, as in the uterus. The tendency of the simple growths is to project into the interior of the stomach, and of the malignant to pass outward into the folds of the great omentum toward the lower part of the peritoneal cavity; or, perhaps, it may be that those which project internally are less liable to become malignant than those projecting externally.

The large myosarcomata frequently have large cystic cavities, to which attention is called (Capello and Virchow). In one case (Goebel) a large cystic cavity in the tumor communicated directly with the cavity of the stomach.

Metastases are mentioned in some instances. Schlesinger and Hansemann mention them as occurring in the retroperitoneal glands, and in Hansemann's case they were found in the liver.

As regards the simple tumors, my attention has been attracted to the depressions or crypts which are shown very clearly in the photograph of the specimen. Virchow described similar appearances, but offered no explanation as to their cause. In his specimen the bottom of the crypt was not lined by mucous membrane, but by inflamed fibrous tissue. In my own specimen the lining was of mucous membrane very much thicker than that covering the rest of the tumor. It is hard to understand from the study of my specimen where the bleeding point was situated, as nowhere can a spot be found where the mucous membrane was wanting.

Battey's specimen shows the same characteristics. His tumor had several sinuses (crypts), which discharged a thick creamy pus.

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I. *Abstract of Cases Submitted to Surgical Procedures.*

No. 1 (Kosinski's Case).—Brodowski, W., 1876, "Ein Ungeheures Myosarkom des Magens nebst secundären Myosarcomen der Leber" (*Arch. f. path. Anat. Berl.*, vol. lxvii, pp. 227 to 231; also Kosinski, 1876, "Ein Fall von Myosarcoma ventriculi et omenti (abstract of *Pam. towarz. lek. Warsz.*, vols. i, ii, 1875), *Jahresb. d. ges. Med.*, vol. ii, p. 226). In February, 1875, there was admitted to the clinic of Kosinski a man, aged fifty-seven years, who had a large tumor in the abdominal cavity. He was greatly emaciated, cachectic, and breathed with difficulty. Three years ago he,

for the first time, observed a feeling of weight in the stomach region, eructation, pain on the left side of abdomen, and constipation. Two years ago he observed the tumor for the first time; after it had reached a size sufficient to occupy two-thirds of the abdomen it was diagnosticated as *echinococcus* of the spleen. Kosinski diagnosticated it as a tumor of the omentum. *Aspiration* of fluid from the tumor relieved the patient somewhat. On the third day sudden collapse. Death.

Autopsy showed that the tumor, which weighed about 12 pounds and measured 30 or 40 by 12 by 16 cm., was attached to the greater curvature. Microscopic diagnosis: leiomyosarcoma ventriculi. Secondary myosarcoma of the liver was found extant.

No. 2 (Rupprecht's Case).—Kunze, Rudolf, 1890, "Zur Casuistik der Myome des Magens" (*Arch. f. Chir. Berl.*, vol. xl, pp. 753 to 759), states that due to the courtesy of Rupprecht he is permitted to report the following case. Male, aged fifty-two years, factory hand. Suffered for fourteen years from moderate pains in the stomach. Four years ago he noticed a tumor in the umbilical region, which slowly increased in size. The pains increased at the same time. No vomiting or eructations. Patient much emaciated, not cachectic; diagnosis of mesenteric tumor. Operation March 19, 1887. Laparotomy. Found that the tumor, which was 10 cm. long, 7 cm. wide, and weighed 251 grams, arose from the stomach wall. Excision of tumor. It was located on the anterior wall of the stomach near cardia. Patient did well for a few days, then contracted pneumonia and died from embolic pneumonia (?).

Autopsy showed that the wound had healed perfectly. Examination of the tumor showed it to be a subserous leiomyoma of the stomach. (With the exception of the one reported by Perls-Neelson, this is probably the largest myoma reported.)

No. 3 (Laroyenne's Case).—Goullioud and Mollard, J.,

1889, "Cancer musculaire de l'épiploon et de l'estomac; gangrène intestinale par lésion du mésocolon" (*Lyon méd.*, vol. lxi, pp. 545 to 555). Female, aged thirty years, was admitted to the service of Prof. Laroyenne March 5, 1889, for abdominal tumor. On October 11, 1887, she was delivered of two infants; had to suspend nursing them on account of anemia, December, 1887. Return of menses six months after delivery; regular until October, 1888. Had suppressed menses of three weeks' standing when she was seen in October, 1888. Since that time the tumor has developed progressively. There was no nausea, no vomiting, no pain, only a marked anemia and impaired digestion. The emaciation was so extreme that operation was done by Laroyenne on March 16, 1889. Laparotomy; tumor was found attached to stomach, omentum, and transverse colon. It was attached along the greater curvature of the stomach. Tumor was loosened and removed; death from collapse six hours after operation. The transverse colon was found isolated from its mesentery for a considerably greater extent than had been suspected during operation (about 70 cm.). It was flaccid, slightly cyanosed. Intestinal gangrene was present.

The tumor weighed 2650 grams. To the naked eye it had all the appearance of fibrosarcomatous tissue. Histological examination showed that the tumor was constituted of embryonic cells of the type of muscular fasciculi. Its origin was no doubt from the tunic or muscular coat of the stomach. Says, "This tumor would quite probably be called a fusiform sarcoma by many histologists." No generalization.

Giuliani, Antoine, 1904, "Des tumeurs musculaires de l'estomac" (*Thèse Lyon*, No. 171, Juillet, pp. 100). In discussing the case reported by Gouilloud and Mollard (see above) the author states that at the point where the epiploic tumor came in contact with the left extremity of the greater curvature was seen a thickening of the stomach wall in which was contained a small soft tumor the size of a two franc piece and several millimeters thick. This tumor contained smooth

muscular fibers and fusiform cells. The tumor of the stomach and the omental tumor had the same structure, and Bard stated that it was a muscular cancer which had formed a secondary tumor in the omentum. The character of malignity of the tumor was given by the generalization of the peritoneum and the embryonic character of some portions of the cells.

No. 4 (Moser's Case).—Moser, 1903, "Ueber Myosarkom des Magens" (*Deutsch. med. Wochen.*, Berlin and Leipzic, vol. xxix, pp. 133–157). Case 2. Greifswald surgical clinic. Female, aged seventeen years; admitted October 24, 1894. Patient has observed a tumor in the abdomen since spring, Palpation revealed a child's-head-sized tumor in middle of epigastrium; tumor is mobile; nodular.

Operation, October 29, laparotomy. While pulling on tumor the stomach was torn for a distance; removal of tumor; suture of stomach wall. Died November 3 from gangrene of the suture line in the lesser curvature; suppurative peritonitis; pulmonary embolism. Tumor was 13 cm. long, 12 cm. wide, and 9.5 cm. thick, and weighed 530 grams.

Microscopic Diagnosis: Myoma with sarcomatous degeneration.

No. 5 (von Erlach's Case).—Von Erlach, 1895, "Ueber ein Myom des Magens und ein Myofibrom der Nierenkapsel" (*Wien. klin. Woch.*, vol. viii, pp. 271 to 274). Female, aged thirty-four years; given birth to fourteen children; two years ago, after delivery of twins, she observed a slightly movable tumor in the left abdomen, size of a fist. Remained the same size until February, 1894, when she first noted rapid increase of waist line. She became pregnant and aborted in the fifth month, seven weeks prior to operation. Slight stomach pains and feeling of weight; no other symptoms. Tumor extends downward as far as symphysis. Movable. Suspected mesenteric or intestinal tumor. Operation, November 19, 1894, laparotomy. Tumor was found attached to lesser curvature. Removal of tumor. Recovery. Extirpated tumor proved to be a leiomyoma weighing 5400 grams.

No. 6 (von Eiselsberg's Case).—Von Eiselsberg, A., 1897, "Zur Kasuistik der Resektionen und Enterostemosen am Magendarmkanal" (*Arch. f. klin. Chir.*, Berlin, vol. liv, pp. 588 to 657). Female, aged thirty years, became ill in the fall of 1894, six months after birth of second child, suffered from headaches and peculiar pains in the region of the stomach. Toward the end of 1895 the patient noticed stomach pains and observed increase in waist measurement: liquid food was borne well, but solid food gave feeling of bursting asunder. Became emaciated. Tumor was located on examination. Examination of stomach contents showed normal conditions. On examination in beginning of March palpation of tumor size of man's head, intraperitoneal, reaching from stomach to symphysis. Operation on March 12, 1896. Tumor was found attached to greater curvature of stomach; no adhesions. Excision of tumor, including base of the stomach wall. Perfect recovery. Toward end of 1896 patient was well, also pregnant. The tumor was found to weigh 5.5 kgr; nodular. Microscopic examination showed it to be an edematous fibromyoma. One of the soft nodules was classified as a fibrosarcoma.

No. 7 (Capello's Case).—Capello and Capello, 1899, "A proposito di un raro caso di mio-sarcome cistico" (*Bull. Accad. med. di Roma*, vol. xxiv, pp. 321 to 324). Female, multipara, aged fifty-four years, was admitted March 2, 1896, for treatment of abdominal tumor. Had suffered pain and general distress in abdomen for past ten or twelve months. In January, 1896, the condition became aggravated; she experienced sensation of weight in gastric region. Examination revealed complete prolapse of vagina and uterus with hypertrophy of the cervix. A diagnosis of ovarian cystoma was made.

Laparotomy. Cyst was punctured and about three liters of bloody fluid aspirated. To the surprise of the operator, it was found that the cyst was attached to that portion of the stomach corresponding to the greater curvature near the

insertion of the gastrocolic ligament. At the point where the cyst was attached to the stomach it communicated with a hard mass the size of an egg. The tumor projected into the stomach. Removal of tumor with portion of stomach wall, to which it was attached. Suture of stomach by Lembert's suture. Good recovery in fifteen days.

Microscopic examination of tumor removed. The entire tumor was about the size of a fetal head at term. It was composed of two portions, a large cystic extragastric part and a solid portion, the size of an apple, within the stomach cavity; it was covered by mucosa.

Diagnosis: Cystic myosarcoma of stomach arising from the muscular coat of stomach.

No. 8 (Nicoladoni's Case).—Steiner, Rudolf, 1898, "Ueber Myome des Magen-Darmkanals" (*Beitr. z. klin. Chir.*, vol. xxii, pp. 1 to 112; 407 to 440), cites the following case:

Eppinger: External myoma of the stomach (preparation of the Path. Anat. Museum, Graz). In February, 1896, male, aged sixty years, was admitted to the surgical clinic of Prof. Nicoladoni; was in a collapsed condition on account of abdominal tumor larger than a man's head. Laparotomy by Nicoladoni and removal of tumor. Piece of stomach 26 by 14 cm. was also removed from near the greater curvature. Patient died eight days post operationem from insufficiency of sutures at transverse colon.

Autopsy by Eppinger. Cause of death: Peritonitis purulenta.

The tumor, larger than the head of an adult, attached to greater curvature of stomach, was 14 cm. long, 26 cm. wide. Oval shape, nodular surface, soft consistency.

Microscopic examination showed it to be a pure myoma in parts.

Diagnosis: Fibromyoma of the stomach.

No. 9 (Herhold's Case).—Herhold, 1898, "Zur Casuistik der Myome des Magens" (*Deutsche med. Woch.*, Leipzic and Berlin, vol. xxiv, p. 60). Female, aged thirty-seven years,

was treated in 1870 for abdominal peritonitis. Had always been weak and anemic. Suffered for the past three years from vomiting immediately after eating. Nothing but food vomited; sour, containing free hydrochloric acid. Palpation of abdomen painful to pressure over different areas, otherwise negative. Careful treatment for three weeks showed no improvement. Laparotomy, January 17, 1897, by Herhold. Removal of hazlenut-sized benign myoma from pylorus. The passage from the stomach to duodenum was contracted or narrowed by tumor, but only moderately so. Recovery good. Fed per rectum for nine days; when regular feeding was taken up vomiting did not occur. Seven months after operation she is in excellent condition, has gained 17 pounds; vomiting only occurs when she overeats.

Commenting on the case, Herhold states that the mechanical interference was not so much the cause of vomiting, the stomach being only moderately dilated, as the reflex disturbance of the neurasthenic patient.

No. 10 (Bland-Sutton's Case).—Foulerton, Alex. G. R., 1899, "Myoma of the Stomach" (*Trans. Path. Soc. Lond.*, vol. l, pp. 85, 86). "The specimen was met with in the course of an operation on the gall-bladder, by Mr. Bland Sutton, in a woman, aged fifty years. The tumor was situated in the posterior wall of the stomach, not very far from the pylorus, and was removed by an incision through the mucous membrane after the viscus had been opened. The tumor is round in shape, and measures 2.3 cm. in diameter. It is of a firm consistence and white in color. Histologically it consists of unstriped muscle, without any admixture of fibrous tissue."

No. 11 (Ehrenberg's Case).—Cohn, Hermann, 1903, "Ueber die primären Myome und Myosarkome des Magens," Diss., 44 pp., Greifswald. Cohn states that Hacker, in 1900 (*Wien. klin. Wochenschrift*), reported a case of a man's-head-sized myoma of the stomach which had been extirpated by Prof. Ehrenberg. No further data.

No. 12 (Poirier's Case).—Poirier, 1902, "Petit fibromyome

de la région pylorique; symptomes de cachexie cancéreuse; ablation; guérison (*Bull. et mém. Soc. de Chir.*, Paris, vol. xxviii, pp. 273 to 276). Woman, aged fifty-eight years, presented all the symptoms of a cancerous cachexia. Had suffered from stomach trouble for ten years; dyspeptic symptoms were quite severe at times, but no vomiting. Abundant metrorrhagia up to and during the climacteric at fifty, when she improved. One year ago the stomach pains were renewed; alimentation became impossible; rapid emaciation from 160 to 108 pounds. Slightly jaundiced. Either liquid or solid food gave rise to excruciating pains, which radiated toward spinal column. Laparotomy. Removal of cherry-seed-sized myoma in immediate vicinity of pylorus. Patient improved; symptoms disappeared; increase of weight. Before operation the tentative diagnosis was carcinoma of the pylorus.

No. 13 (Moser's Case).—Moser, 1903, "Ueber Myosarkom des Magens" (*Deutsche med. Woch.*, Berlin and Leipzic, vol. xxix, pp. 133 to 157.) Female, aged forty-one years, had syphilis when a child. Menses at nineteen, accompanied by severe gastric pains, which, however, soon ceased under treatment. At the age of twenty-four she was again attacked by stomach trouble, with exceedingly severe gastric pains, which continued for a year. Frequently vomited blood. At twenty-six and at thirty she experienced two severe gastric attacks. Suffered all the time from acid eructations and bad taste in mouth. Two weeks before operation she felt a tumor in the abdominal region.

Laparotomy, February 19, 1902. After loosening numerous adhesions, it was found that the tumor originated from the posterior wall of the stomach in the region of the lesser curvature. Extirpation with resection of a portion of the stomach wall. Patient in collapse. Recovery gradual. A fistula remained for some time and gradually healed up. When seen six months later she was found to be in a tolerably good condition, and expressed herself as feeling better than

before the operation. The tumor was almost the size of a man's head, the removed particles weighing about 1500 grams. Microscopic findings led to a diagnosis of myosarcoma.

No. 14 (Samter's Case).—Samter, O., 1904, "Ein Fall von Myoma pylori" (*Deutsche med. Wochenschr.*, Leipzic and Berlin, vol. xxx, pp. 914 to 915). Female, aged forty-nine years, unmarried, was referred for operation to Samter, September 22, 1902. History: Years ago an operation of some kind for uterine hemorrhages; since then she suffers from continued pressure symptoms in the region of the stomach; nausea, but no vomiting; accompanied by emaciation.

No tumor could be diagnosticated, inflation resulted negatively. Pyloric region sensitive to pressure; one hour after test breakfast stomach always found empty. Repeated analysis of the stomach contents failed to show free hydrochloric acid or lactic acid, but did show long bacilli. Suspected beginning carcinoma. Laparotomy, September 29, 1902. Removal of adhesions from abdominal wall to anterior border of stomach; stomach could then be easily lifted out. Bean-sized tumor felt in pylorus, slightly movable within the pyloric substance. It appeared to be attached to the inferoposterior border. Resection of the pylorus combined with Hacker's gastroenterostomy. Recovery good. Dismissed, cured, November 3, 1902. Has been repeatedly examined since, and the motor efficiency of the stomach was found perfect. Has complained to some extent recently, but it was difficult to ascertain the exact nature, as the patient was in possession of a sick benefit. Tumor proved to be a myoma.

No. 15 (Delore's Case).—Delore, X., and Leriche, R., 1905, "Leiomyome malin de l'estomac" (*Bull. méd.*, Paris, vol. xix, pp. 794 to 796). In August, 1903, there was admitted to the clinic of Poncet an old man who had suffered for a long time from bronchitis, emphysema, and stomach trouble. It had its beginning fifteen months ago, with weight after eating, impaired digestion, etc., six months ago vomiting for the first time, which had of late become a con-

stant occurrence. Emaciation was marked. On palpation a tumor the size of an apple could be made out to the left and above the umbilicus. Stomach slightly dilated. Laparotomy by X. Delore. The pylorogastric tumor was circumscribed and limited; extirpation was decided on. Transmesocolic posterior gastro-enterostomy. Recovery good. Microscopic examination of tumor led to diagnosis of leiomyoma of malignant type. Patient was seen in March, 1905, perfectly well. Died June, 1905, but so far as known no recurrence.

No. 16 (Goullioud's Case).—Giuliani, 1903, cites in full the following case by Goullioud: "Leiomyome malin de l'estomac developpé sur la grande courbure, près du pylore; ablation avec pylorectomie; ganglions dégénérés; guérison" (*Cong. Franc. de chir.*, 1903). Male, farmer, aged forty-four years, admitted to Saint Joseph's Hospital at Lyon, June 9, 1903, for tumor of the right hypochondrium. In May, 1902, first signs of gastric trouble; nausea, efforts to vomit; anorexia. Tumor was diagnosticated. On June 16, 1903, exploratory laparotomy; tumor adherent to greater curvature of stomach near the pyloric region. It had developed or extended into the gastrocolic omentum; pylorectomy and removal of tumor. Operation was completed by a gastro-entero-anastomosis à la Hacker. Patient was seen again February 3, 1904, and had improved considerably. Weighed 62 kilograms before operation, and had now reached the weight of 76 kilograms. No signs of recurrence.

Histological examination of the tumor and ganglion tissue by Dr. Cade showed ganglionic involvement or generalization.

Diagnosis: Leiomyoma with generalization in ganglia, "généralization ganglionnaire."

No. 17 (Pernice's Case).—Moser, 1903, "Ueber Myosarkom des Magens" (*Deutsche med. Wochenschrift*, Leipzic and Berlin, vol. xxix, pp. 133 to 157), reports a case of myosarcoma of the stomach which was successfully operated on by Pernice, at Frankfurt.

No. 18 (Ochsner's Case).—Yates, John L., Milwaukee, Wisconsin, 1906, "Sarcoma and Myoma of the Stomach (*Annals of Surgery*, Phila., vol. xliv, pp. 599 to 615). Male, aged seventy-three years; family and past history unimportant. Present illness began ten years previously with distress in epigastrium, usually associated with eating; was fairly constant, with occasional slight exacerbations. Within the last few months attacks of colic, followed by slight jaundice; no hematemesis nor melena.

Physical examination, aside from a rather marked anemia and emaciation, revealed nothing of importance beyond a decided tenderness in the mid-epigastrium and over the region of the gall-bladder. Patient sallow but not jaundiced. The gastric symptoms had been so much more intense than usually seen in cholelithiasis, that, taken together with the patient's condition and age, a carcinoma or ulcer of the stomach was suspected in addition to gallstones, in spite of the absence of dilatation, palpable tumor, and signs of obstruction.

Operation by Dr. Ochsner June 29, 1905. A walnut-sized, slightly nodular, pedunculated tumor was found growing from the everted posterior stomach wall near the greater curvature. Removal. Removal of nine gallstones from gall-bladder; cholecystectomy completed the operation. Perfect recovery. In a letter written May 18, 1906, patient states that he was well as ever, barring the customary infirmities of old age.

The myoma measured 3 by 2 by 1.5 cm.

No. 19 (Goebel's Case).—Goebel, 1907, "Myoma ventriculi und Tuberculosis omenti" (*Deutsche med. Wochenschr.*, Leipzic and Berlin, vol. xxxiii, p. 1908). Female, aged sixty-nine years, had observed a tumor for four months in left abdominal region, extending as low as below the umbilicus. She became emaciated. No HCl in stomach, probably some lactic acid; not positive. Diagnosis of retroperitoneal tumor of omentum made. Exploratory laparotomy showed

a tumor with numerous omental adhesions; tumor was torn during operation; hole closed by omental tampon. Died several days later from collapse. Examination of tumor proved it to be a pure leiomyoma, arising from anterior wall of stomach, it contained a cavity which communicated with the lumen of the stomach. The walls of the cavity were partly necrotic. No further data.

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DISCUSSION.

Dr. Maurice H. Richardson, of Boston.—I should like to say a word or two about this very interesting case. What I want to hear from the members of this Association, and what I hope they will freely give us, is their own experience in connection with the subjects under discussion. What interests me in connection with this case is the importance

and difficulty of diagnosticating tumors at operation, even with the tumor actually in the hands. I have at times been unable to tell the difference between a malignant tumor of the pylorus and the thickening of a chronic ulcer. We cannot always have on hand the expert with his microscope, and yet it is of exceeding importance to make on the spot an accurate diagnosis. If we cannot make, from the history, the look, and the feel a reasonably precise diagnosis, then we cannot tell the prognosis or decide the course of procedure.

It seems to me that in this, as in subsequent papers, each one of us should give fully his experience, and especially his unforfunate cases, in order that we may get what we attend this meeting for, viz., the full and fearless expression of opinion and experience.

I have nothing of particular interest to bring to the discussion of this paper, except that I find at times great difficulty in telling just what is the matter, even when the tumor is in my hands and in full view. Usually the exploratory diagnosis is entirely tactile, and errors are not uncommon. Even with the lesion in full view, the diagnosis is often doubtful. I could illustrate these remarks by the citation of many errors in diagnosis that I have made in my own practice. I have seen similar mistakes made in the practice of other surgeons. Everyone here who has done much gastric or abdominal surgery for tumors must know that there are many cases in which the surgeon must decide on the spot what he is going to do, wholly from history and from gross appearances—from the sense of touch, from the sense of sight, and from his own experience. Every case of this kind widens a man's horizon and adds to his knowledge; and I feel very much indebted to the author of the paper for reporting so interesting a case.

Dr. Charles H. Mayo, of Rochester, Minn.—Benign tumors of the stomach are so rare in comparison with malignant growths of this organ, that they are very seldom thought of. There are quite a number of these cases found at autopsy, as the essayist has pointed out; in short, the most of them.

I want to report briefly some cases of benign tumors, one of them a large adenoma, which projected as the essayist has stated, the benign tumors working toward the interior of the stomach instead of without. This adenoma was as

large as a pear, with large pedicle, not eroded, and not bleeding; a pure myoma as large as two fists in the posterior wall, projecting into the stomach, and was removed by excision. Furthermore, three cases of muscular hypertrophy of the stomach that produced obstructive symptoms. These occurred at the pyloric end of the stomach and were similar to those we know of as occurring in babies, with muscular hypertrophy encircling the pyloric end of the stomach, causing starvation and death. These were in adults, and yet the stricture was the same, requiring resection of the stomach for the pyloric tumors. Of these four myomas, one was excised, and three were resected. When a patient is put upon the table and we have to decide as to the nature of the tumor, it is difficult to do so, as Dr. Richardson has pointed out. But the indications in these cases were clear. There was obstruction from the presence of a tumor, and resection was accordingly made. Of course, the first impression was that the tumors were probably malignant, but after being removed and sections of the same examined at the laboratory, it was found that they were pure myomas.

Dr. George W. Crile, of Cleveland.—I want to add a case of myoma of the stomach which was operated on by my associate, Dr. Lower. This case conformed pretty well to the one that has been described by the essayist.

I also want to report a case of adenomyoma in my own experience, situated in the wall of the stomach. It was supposed at the time of operation to have been a sarcoma. The tumor was resected, and the patient recovered.

Dr. Thompson (closing).—I have very little to add to what I have said already, except that Dr. Richardson's talk brought out the real point. At the time I was operating I thought I was dealing with a malignant rather than a benign growth. You will notice, on examining the specimen, that a large portion of the healthy stomach has been removed. If I had known that I had to deal with a benign tumor, a much simpler operation of excision would have sufficed.

CONCLUSIONS BASED UPON OBSERVATION OF FIVE HUNDRED CASES OF FRACTURED SKULL.

By Walter C. G. Kirchner, M.D.,
St. Louis, Missouri.

During the past seven years, while engaged in work at the St. Louis City Hospital, opportunity was offered for observing several hundred cases of fracture of the skull. All classes of fracture and injury were met with, and among the number were many interesting and remarkable cases. In treating the subject, it is intended rather to convey impressions or conclusions that have been formed from an experience with this class of cases than to enter into a statistical study.

In order to obtain a definite understanding of fractures of the skull it is necessary to study these conditions at the autopsy table and in the operating room. Valuable points of surgical and neurological interest may be gathered in this way, and one is often surprised to learn that lesions apparently insignificant and giving little visible indication of trouble have been the cause of such profound and serious symptoms. It becomes necessary at once to differentiate between those injuries which are epidural in character and those which primarily or secondarily affect the brain and its coverings. The brain, when injured, may be subject to contusions, lacerations, hemorrhages, softenings, edema, anemia, and to nutritional changes.

In postmortems the gross changes, due to hemorrhages,

softening, edema, etc., are easily noticed, but alterations in the more minute structures are often overlooked and the brain is considered normal when in reality it has been the cause of grave symptoms. It is very probable, as Phelps (*Ann. Surg.*, December, 1906) has indicated, that nutritional changes in brain structures are often the result of injury to the organ, and that these changes are of such a complex nature that a definite neurological picture cannot be obtained. This observation seems an important one, for it serves to explain the trouble in many cases, and should always receive consideration from the standpoint of prognosis and treatment. Apparently these nutritional changes, as a result of trauma, may be confined to localized areas of the brain independent of gross lesions, just as if they were brought about by pressure.

Fracture of the skull by contrecoup is well recognized, but the fact that the brain may also be injured by contrecoup is not sufficiently appreciated, and not infrequently softening or abscess of the brain develops on the side opposite to the injury on the skull. Contusions of the brain, with resulting effusion of blood or of serum, and edema, are a frequent accompaniment of fracture of the skull, and may be present even without fracture. At operation the subdural space often contains fluid under pressure, which fluid may be bloody or clear in character.

Where there is epidural hemorrhage the clot which forms may cause considerable compression of the brain. If the clot or blood is removed soon after the receipt of injury, the brain thus compressed may react, regain its former shape, and show pulsation. If, however, compression has existed for some time, the brain, in most cases, does not react, the area of compression remains, the dura becomes flaccid, and pulsations are usually absent. In operations shortly after the time of injury the blood and clot may be easily removed, and it is often forced out through the trephine opening by the intracranial pressure. In operations that are deferred

to a later period the clot is found to be less easily removed, and often becomes densely adherent to the dura.

Where compression of brain tissue is more or less acute and is permanent, the brain usually does not react, and destruction of brain tissue and impairment of functions result. Where the compression is gradual and of a chronic nature, the brain may be given an opportunity to react and the lesion becomes more localized.

It is evident that the symptoms of fracture of the skull depend rather upon involvement of the brain than upon injury to the cranial bones, and in all cases of fracture or of suspected fracture of the skull a careful neurological examination is demanded. While the neurological findings are important, they are not always reliable or conclusive as indicative of the location of injury, because often in injury to the skull and the brain the lesions are of a complex nature and are multiple, or they may be remote from the seat of injury. The external evidence of fracture of skull may be slight, and yet later the patient may show grave symptoms of injury. In most cases where there is fracture and the patient is conscious, pain may be elicited over the site of fracture, though hematoma or other evidence be lacking.

The symptom of pain on pressure over an area of the scalp, especially in older and in doubtful cases, is an important sign, and frequently indicates linear fracture of the skull. Hemorrhages into the orbital tissues are frequently mistaken for "black eye" and the direct result of external violence, when in reality they are due to fracture of the skull. Sometimes a "crack-pot" sound may be elicited by percussion, especially when the skull itself has been laid bare.

When the body has been the active agent in producing a fracture, such as would occur in a fall from sufficient height, the symptoms are usually pronounced, while in many cases in which the body has been passive and the fracture is the result of a blow the initial symptoms may be very insignificant. In certain instances the bony structure is of

sufficient resistance to permit little damage to the skull, the force being spent so as to damage principally brain structures, while in other cases the skull is the chief seat of injury, the force of the shock affecting the brain but little.

Fractures of the skull, especially when the base is involved, are usually accompanied by mental disturbance, and in serious cases the patient is unconscious or semiconscious. Unconsciousness coming on shortly after injury is only of relative value, and is not always indicative of the seriousness of the injury. If unconsciousness is followed by a period of consciousness, and later again by unconsciousness, it usually indicates that there is serious brain disturbance. With a patient having the advantage of rest, and if consciousness be followed by an unconscious period, the symptom should be regarded as an important one of serious injury. Unconsciousness and confusion of mind often come on as a result of slow hemorrhage or breaking down of brain tissue, and such patients may be restless and appear drowsy, stupid, and apathetic. In children, when the head is injured, convulsions are not uncommonly met with, but may be no indication of the seriousness of the injury. In adults status epilepticus is sometimes encountered, which should be seriously regarded when it occurs shortly after injury.

Serious fractures are accompanied by shock—and in the early stage the body temperature is normal or frequently subnormal. The pulse is more frequently slow, full, and strong. The respiration is often but little altered, except in moribund cases, when it is apt to be labored or stertorous. Vomiting may occur in many cases, and in unconscious cases there is frequently difficulty in swallowing. Where the injury is localized the neurological examination is of great value in eliciting focal symptoms.

In all cases of head injuries and resulting mental disturbance, it is important to know whether or not the skull has been fractured. The knowledge of an existing fracture of the skull is of distinct diagnostic value. The diagnosis may

be arrived at by methods of neurological examination or by ocular demonstration. In lacerated scalp wounds the nature of the fracture may often be demonstrated. In fracture of the base there may be bleeding into the orbital tissue and from the nose, mouth, or ears, but in these instances careful examination should be made to exclude hemorrhage of these organs from other causes. The demonstration of cerebrospinal fluid is evidence of fracture of the skull. Where the scalp is intact, exploratory incision over hematomata or painful areas is indicated as strongly as are exploratory punctures or incisions for purposes of diagnosis of conditions in other parts of the body. Exploratory incision often gives additional and valuable information, and, as a rule, the periosteum is found to have been loosened if fracture is present. The location and the direction of lines of fracture and the extent and the nature of the injury to the skull may serve to explain many of the neurological symptoms.

If the brain is uninjured, the neurological symptoms may be wanting, and the diagnosis must be based upon direct examination. It is important to differentiate between concussion, contusions, or other injuries to the brain, and those symptoms which are the result of compression due principally to hemorrhage. At times, however, this is impossible, and certain cases with symptoms of contused brain cannot be diagnosticated from those in which there is hemorrhage with compression. Spinal punctures have a certain diagnostic value as an index of the character of the fluid and the degree of tension.

Great difficulty may be encountered in determining the source of a suspected hemorrhage, because focal symptoms which are present when the hemorrhage is small and localized disappear when the hemorrhage increases and the brain becomes more extensively compressed. As the symptoms of compression increase, the patient may pass from a condition in which the mind is confused to one of unconsciousness.

In the early stages of fracture of the base there may be

shock, subnormal temperature, slow and full pulse, regular or labored respiration, vomiting, visible evidences of fracture, unconsciousness, restlessness, and in general diminished or altered reflexes.

Intracranial pressure in the early stage may be characterized by impaired mental state, restlessness, regular respiration, a full pulse, and reflexes pointing to focal symptoms.

In fatal cases, and in later stages of serious cases of fracture the temperature may be elevated and the volume of the pulse diminished. In uncertain cases it is important to differentiate fracture of the skull from uremia, apoplexy, and alcoholism.

In cases of fracture of the skull the prognosis should be guarded, at least for the first few days. Cases seriously injured and suffering from shock usually die within forty-eight hours. Certain cases do well for a few days, and then suddenly and unexpectedly die. The prognosis is much worse when subdural complications exist than when the injury is extradural. Injury to the dura mater may lead to serious complications. Unconsciousness in itself is not of much value as an indication of the patient's condition, but when the reflexes are present and about normal the prognosis is good. In those cases that react the pulse and temperature remain nearly normal, but when the volume of the pulse diminishes and rate is increased, and there is decided elevation of temperature, the prognosis is very bad and a fatal issue usually ensues.

In the treatment of fracture of the skull we should distinguish between surgical and neurological indications for operation. The neurological signs may not be pronounced, yet surgical intervention be distinctly indicated, while, on the other hand, the surgical aspect may not be emphasized, and yet the neurological findings be definite and conclusive. The neurological condition being subject to changes, it is demanded that the patient be kept under continuous observation. When possible, the scalp having been properly prepared, the existence of the fracture and its nature and

extent should be determined by exploratory incision if necessary. Simple linear fractures of the vault, when not causing complicating symptoms, require but little surgical treatment. In depressed fractures the depression should be raised, and all pressure on the dura mater should be removed. When the depression is complicated by comminution, effort should be made to retain fragments, so that the bony deficiency may be limited as much as possible. Examination should be made for epidural hemorrhage and clot, and, if necessary, drainage instituted. By puncturing the dura the character of the cerebrospinal fluid may be ascertained. If the dura has been injured, it should usually be sutured if possible, and if bulging of dura is due to tension of the cerebrospinal fluid, this may be relieved by spinal puncture. Depressed bone should always be elevated or removed, since pressure and irritation are frequently the cause of convulsions.

The operation should be directed primarily to the relief of brain compression, which may be due to hemorrhage or to blood clot. As a rule, the sooner the blood or clot causing pressure is removed, the better will be the prognosis, and when removed the danger of sequelæ may be avoided. Moreover, old clot is removed with greater difficulty. If large accumulations of blood and clot causing compression are not early removed, the brain will not react and death may result. Therefore, when signs of compression are present early operation is indicated.

In doubtful cases, where the symptom complex of the neurological findings is such that focal symptoms are lacking, exploratory operations are indicated, and it is often better to explore than to wait for symptoms which, when they become manifest, are the result of brain compression and the destruction of brain tissue.

With improvements in methods of technique, the danger and complications of operation will be lessened, and the indications for early cranial surgery in doubtful cases may

become as urgent as they are in doubtful intra-abdominal conditions where laparotomy is resorted to. While it is usually better to explore early than late, in a certain class of doubtful cases it may be better to wait, the time for operative interference being indicated by a rise in temperature and diminished blood pressure. In fractures at the base, where the symptoms point to nutritional changes and extensive destruction of brain tissue, operation is not indicated, but where there are distinct signs of hemorrhage and pressure, operative procedure, with drainage of the middle fossa, has given good results.

Bone deficiencies are often an annoyance to the patient when recovery takes place, and, therefore, when time is not too great a factor, the bone flap operations are to be preferred. In cranial surgery of an emergency character, additional shock should be avoided, and the control of hemorrhage and the duration of operation are important factors.

Experience has shown that in compound fractures and in injuries to dura or brain thorough drainage of the wound is important.

Aside from elimination and remedies influencing blood pressure, therapeutic measures seem to be of little value in fracture of the skull. In all cases rest is important, and patients should not be allowed to get out of bed for a number of days.

Conclusions. Linear fractures of the vault usually do not require operation unless they involve important vessels or sinuses.

In depressed fractures, the fragments causing compression should be elevated or removed.

Experience has shown that in compound fractures, especially where there is injury to dura or brain, drainage of the wound is usually desirable.

Operation for fracture at the base is indicated where hemorrhage is extradural and where there are signs of compression. The middle fossa is most frequently involved, and drainage here can be easily instituted.

The practice of examining hematomata by means of exploratory incision, when reasonable precautions are taken, is practically without danger, and often gives most valuable information as an aid in diagnosis.

The neurological findings are of value in determining focal symptoms, but when complex brain disturbances exist they may be unreliable as diagnostic aids, and require special interpretation.

Brain compression is a positive indication for operation, and, as a rule, the sooner compression is removed the better the prognosis.

At operation, shock and hemorrhage are factors that should be carefully regarded, and operation should be done as speedily as possible.

In doubtful cases, where it is probable that the symptoms are caused by brain compression, exploratory operations are indicated.

The expectant treatment is to be advocated in those cases in which there are no symptoms of brain compression, in which the temperature and pulse remain nearly normal, and in which the reflexes are but little altered. Unconsciousness in itself is no index of the seriousness of the trouble.

Operation is contra-indicated in those cases in which the symptoms are the result of intrinsic destruction of brain tissue, when the temperature is high, where the pulse is rapid and the blood pressure diminished.

The importance of a longer period of rest in bed should be more strongly emphasized, so that the danger of secondary complications may be avoided.

DISCUSSION.

Dr. John D. S. Davis, of Birmingham, Ala.—There is one point with which I disagree in this paper, particularly with regard to linear fracture. I have never seen one that did not sooner or later give trouble from the pressure which

resulted, and I think it is always better in these cases to explore and determine whether or not there is any trouble.

Dr. J. Shelton Horseley, of Richmond, Va.—I have never been able to see what good we could accomplish by exploring a linear fracture that is unaccompanied by symptoms. Converting a simple into a compound fracture and opening a large surface of bone can do no particular good. If there is marked depression, or if there are focal symptoms showing brain trouble, operation should be done at once; but in a case of simple linear fracture without depression, and without focal symptoms, we merely add more trouble and do more damage than we can do good by attempting to remove some of the bone, thus leaving a larger raw surface, with more adhesions and greater probability of subsequent trouble taking place.

I do not think the work of Phelps, of New York, has been fully appreciated. I do not suppose any man in America has had more experience in traumatic brain surgery than Phelps, and yet after a large experience he became more conservative than he was at first. He pointed out that a great many cases just on the borderline would be killed by operation, because, he said, not only may there be actual pressure from the presence of bone, but there is edema and degeneration of the cortical cells produced by hyperemia which cannot be entirely relieved by the removal of bone pressure. In such a case even a slight operation, skilfully performed, may accentuate the edema that is present, which might be recovered from under conservative treatment, such as rest in bed, purgatives, quietude, and cold to the head.

Dr. Maurice H. Richardson, of Boston.—In treating these acute traumatic cases, we must not forget the possibility of epilepsy and other secondary results. I should like to know the experience of the Fellows as to the frequency of these sequelæ. Patients come to me suffering from the remote results of injuries to the head when no lesion was at the time of injury demonstrable. The question which interests me, and which should interest surgeons generally, is: How can we be sure that we have not overlooked some serious injury—a linear fracture, for example—to a skull in which, to the touch or to the sight, the injury seems trivial. I have found operations for epilepsy secondary to fracture

of the skull so discouraging that I do not now undertake them with any real hope of permanent good. When patients come in with injury to their heads, I feel now as I did when the subject was discussed in Boston twenty years ago—that we must take great care lest we overlook a serious injury of the skull, thinking it a trivial one.

I do not feel that I can add anything to this discussion except my own discouraging experience in the treatment of late symptoms caused by trauma in which, presumably, there has been a certain amount of laceration and hemorrhage due perhaps to a fragment of bone projecting through the dura mater into the cortex. Once the epileptic habit has been established, there seems to me little hope in removing the exciting cause, although I have always done so.

Dr. George W. Crile, of Cleveland, Ohio.—The paper that has been presented this morning is based on an unusual experience, and I think the propositions laid down by the essayist are excellent.

I should like to suggest the use of urotropin in cases of fracture through the base of the skull. It is based on this fact: If you give large doses of urotropin, it may find its way into the cerebrospinal fluid. It is apparently best to give about one hundred grains a day. A patient is unconscious; the pulse tension is very high, but the pulse rate is slow. It is nature's effort by this rise in blood pressure to give the brain a little nutrition and try to overcome the anemia of the vasomotor centres, and the centres of the brain respond in that way. Hill and others have shown that a mere dribbling of blood in the brain will keep the spark of life going. Six or seven minutes of total anemia of the cortex may produce fatal degeneration. The respiratory and vasomotor centres endure anemia much longer than the cortical centres.

Dr. Miles F. Porter, of Fort Wayne, Indiana.—It occurs to me that these cases should be viewed from two distinct aspects: One as to the immediate, and the other as to the remote results. First, as to the immediate results. I take it, many of these secondary fatal edemas of the brain can be averted by exploratory operation, such as the doctor has advised in doubtful cases. Also, by these exploratory operations, we can remove conditions which will later on lead to serious trouble, such as epilepsy. If it is true, and

it must be so, judging from the published testimony, that about 30 per cent. of the children receiving cranial injuries at birth, subsequently develop epilespy, it is probably true that quite a large percentage, a much larger percentage than we perhaps have believed of these injuries to the skull and brain in adults, subsequently develop epilepsy. If these epilepsies are to be cured—if you will permit me to use an Irish bull—we must cure them before they begin. After the epileptic habit has become established, even though it be clearly of traumatic origin, these cases do not respond very well to surgical procedures. A large number of them are cured temporarily, but only temporarily. The lesson is this: If we would do good in these cases, it must be done by early operation. In other words, we must strive to prevent the development of epilepsy rather than to cure it after it has once been established.

Therefore, I am heartily in favor of the suggestion, that in these cases, where there is doubt, much of the doubt may be expelled by an exploratory operation, which should be done just as we would explore, as the writer has said, for instance, the abdominal cavity.

Dr. Le Grand Guerry, of Columbia, S. C.—This is a very interesting paper, and I wish to speak of one or two points, one of which has been mentioned by Dr. Crile, namely, the use of urotropin which, I think, was accidentally discovered by Dr. McCallum, of Baltimore. McCallum first recovered pure formaldehyde in a biliary fistula from a patient in the hospital: and it has since been recovered in the cerebrospinal fluid; in other words, pure formaldehyde was recovered from the cerebrospinal fluid after the use of urotropin. The point has been brought out that urotropin should be given in large doses—at least, one hundred grains a day. That is very important.

Let me speak of one other point, and it is this: Dr. Cushing read a paper before this Association last year at its New Orleans meeting in which he advocated a measure for basal fracture, that had a rational foundation, we believe. I refer to the operation of decompression for the relief of definite fractures at the base of the skull. I think those cases do not die from infection as it was formerly supposed, but from an acute edema of the brain. We have had some experience with the operation of decompression, and are

favorably disposed toward it. If the essential pathological lesion is an acute edema of the brain then this operation has a rational foundation.

Dr. R. M. Cunningham, of Ensley, Ala.—I have seen a great many cases of fracture of the skull, perhaps one hundred and fifty. They can be divided into four different classes: (1) Those in which the patient is killed immediately or dies within a few hours. They call for no comment. (2) Those in which there are gross surgical lesions and pronounced neurological symptoms. (3) Those in which there are gross surgical lesions, with very few or no neurological symptoms. (4) Those in which there are pronounced or slight neurological symptoms, yet no gross or surgical lesions.

As I have remarked, the first class do not call for any comment because they are either dead or will soon die. In the second class, there should be no dispute, for here we have a lesion with symptoms calling for operative procedure. The third class, those in which there are gross pathological or surgical lesions, and few or no neurological symptoms, are common in fractures of the vault, where there is a depression or comminution of bone, with or without symptoms, and operation should always be performed. Many of these cases can be operated upon easily without any shock or danger attending the procedure. Where there is a linear fracture, without depression and without symptoms, my course is determined by the source of the injury. If the fracture is by direct violence, with a small implement, or there has been a fall from a height upon a small obstacle, or if there is the least indication of depression of the internal table, and a linear fracture leading off, perhaps stellate, I would operate. And why? Because there is a strong probability that the internal table has been scaled off and has stuck into the dura. I have found that condition quite frequently. If the trouble is due to a fall upon a smooth surface, like the floor or the ground, or a blow with a large instrument, and we have a crack in the skull, without any visible depression of the external table, and without its radiation in a stellate direction, and without neurological symptoms, I would not operate. What is the use? You have a crack in the skull, just like a crack in a piece of glass, it will heal with but very little callus, and there is very

little danger of a tumor or endostosis growing from the internal surface of the skull. Many of these patients have been observed to resume their work with a crack in the skull. Our method, under all circumstances, where we have an injury, or contusion of the scalp, is to explore and see.

In regard to the after-effects, such as the development of epilepsy, I have had occasion, I presume, personally to examine not less than thirty thousand individuals in the last twenty years personally, and perhaps more than that; in fact, I do not know how many, and it is not an infrequent thing to find a person with a depressed skull from a blow, and it is a very infrequent thing to find one of them who has epilepsy. I would be glad to give percentages regarding these cases, but I cannot do so now. It is simply a matter of clinical observation. I believe that many of the cases with visible lesion of the vault of the skull, or with a history of injury to the skull, who have epilepsy, were epileptics beforehand, and in my own personal experience I have known serious injuries to the skull occur at the vault during an epileptic attack.

In this connection the medicolegal aspects are of the utmost importance, and a diagnostic point is the peculiar delirium that manifests itself immediately after the injury. This involves sometimes thousands of dollars on the part of an industrial corporation. If a patient is epileptic and falls from a height, no corporation can be held responsible.

In regard to operation, I agree with Dr. Richardson and Dr. Porter that the time to cure epilepsy is before a patient has it. They undoubtedly acquire the epileptic habit and operation does not do much good.

In regard to fractures of the base of the skull, I do not agree with those gentlemen who look upon the remote results of death as being due to edema. It is true, in only one of the instances did we make a laboratory examination, and in this case the pneumococcus was found, with a visible meningitis. I have made a number of postmortem examinations, and from observation I would certainly say there is a meningitis in many cases.

In fractures at the base of the skull in the region of the ethmoid there is much more danger of meningitis than in a fracture at the base which involves the petrous portion of the temporal bone. You can disinfect the auditory canal,

but you cannot disinfect the nasal passages and frontal sinuses, so that in the treatment of fractures at the base of the skull, where we know that the lesion is in the petrous portion of the temporal bone, we should be particularly careful to disinfect the auditory canal. This should be done with soap and warm water, then with a piece of cotton on a probe, swab out with 1 to 10,000 bichloride of mercury. Do not put any cotton in the canal; you need hemorrhage in order to obtain the mechanical cleansing effect of the blood as well as its disinfecting properties. Cleanse external ear and side of head and dress with moist aseptic gauze.

We have had seven cases of fracture at the base of the skull this year, with one death. It was hemorrhage that killed this man, although we operated on him within two hours after he was brought to the hospital. In his case there were all the pronounced neurological symptoms. There was no fracture where he was cut on the side of the head, but when I went to make the operation after the manner of Dr. Cushing, I found that there was a stellate fracture at the base of the skull, with an enormous clot, which was removed, and which I supposed came from the middle meningeal artery, but which did not. It came from a fracture in the bone itself, and everything was so full of blood that the man had to die, and did die promptly.

Dr. Crile has explained to me the cause of death in one of my cases of enormous fracture of the vault, which measured, if put end to end about twelve inches. There was an enormous depression of the anterior portion of the parietal bone. Operation was done, the depressed portion raised, loose pieces removed, all hemorrhage was stopped, but he had complete paralysis of the right side, paralysis of the left leg, the lesion going across to the right side and involving the centre for the leg. He recovered from the paralysis in his left leg, and died insane. The wound healed primarily.

Just a few words more in regard to the sinuses and I shall have done. Of all the places to be hurt, it is over the torcular herophili. A small boy was struck with a piece of iron in this region, the area being about the size of a nickel. There was not a neurological symptom; there was no hemorrhage, and there were grease and dirt and bone pressing inside of the skull. The usual technique of cleansing, etc., was resorted to by my assistant. When I saw the case I told

my assistant to lift out the bone with forceps, and in so doing a stream of blood poured out about the size of my finger. I knew there was such a thing as the torcular herophili, but had forgotten about it. I know that some scientific surgeons say that the thing to do is to ligate it, but you would have four streets to cross, so to speak, and it is like Piccadilly in London. The opening was packed with gauze to stop hemorrhage, the next day when we came to dress the wound again the hemorrhage recurred. I told my assistant not to dress the wound after this until we knew that a clot had formed, which would prevent the boy from bleeding to death. We waited four days, there was no further hemorrhage, but a prompt recovery from the traumatic injury. Subsequently, the boy became blind in one eye. This was probably due to degeneration, as has been pointed out by Dr. Crile. From the formation of a secondary clot we succeeded in preventing this boy from bleeding to death. This is the only instance I have ever known of remote results from a clot that was used as a hemostatic, and I believe Dr. Crile has explained the reason.

Dr. Horace J. Whitacre, of Cincinnati, Ohio.—A most valuable point in this excellent paper seems to be the remote effects of the class of injuries under discussion. I do not know of any paper on this subject that has been of greater interest to me than one which appeared some time ago in either the *London Lancet* or the *British Medical Journal*—I forget which. This paper reported a long series of observations on head injuries, ranging from the fall of a child from a high chair which was accompanied with a temporary period of unconsciousness, and no further symptoms, to the most extensive brain injury. This investigation was undertaken with a view to determining the remote effects of such injuries. First, the effect which such injuries would have in producing either definite disease, such as traumatic epilepsy, or cyst formation, and second the result upon the mental capacity or wage-earning capacity of these individuals. Briefly, the result as to the second point was to the effect that a very large percentage of patients suffered from some impairment in their intellectual capacity or they experienced a decreased wage-earning capacity. For instance, lack of ability on the part of a carpenter who has been in the habit of working at high altitudes to return to

this part of his work. He could work at other parts of his trade, but he had lost some of his ability along these lines. There was one important suggestion made in this article which I have carefully applied in my own practice, namely, to keep these patients, no matter how slight the injury, away from business and free from all mental work for a long period of time. For example, I have kept schoolboys for six months at a time, and business men from their duties six months to a year after such an injury, even though they were apparently well and had recovered promptly. My series of cases has not been sufficiently large to justify a conclusion as to whether this method has given better results than were formerly obtained, but the suggestion seems to be justified by the results reported in this paper.

Dr. Kirchner (closing).—I wish to thank the gentlemen for the interesting points that have been brought out. Some of the questions asked have been answered by those who have taken part in the discussion.

The remote conditions are very important, but I believe that they increase in proportion to the neglect that these cases received in the early stages, and, therefore, I think it is of the utmost importance that an accurate diagnosis be made even when the symptoms are insignificant, or even when they are not present. From the standpoint of diagnosis, the mere knowledge of a fracture is very important, because it gives us indications of further treatment of the case, and when the first symptoms appeared they should be looked after, and I believe in this way many cases of epilepsy of traumatic origin may be avoided. There are many cases in which an injury is received without the manifestation of any symptom, and these can only be cleared up by exploratory incision. If these patients are watched for a number of days and do not do as well as expected, and there are present the slightest focal symptoms of fracture, the skull ought to be opened, and in many cases we will find a localized subdural or epidural hemorrhage; the effect of these localized areas of hemorrhage or edema may be sufficient to bring about adhesion of brain tissue to the dura, and these adhesions of themselves are apparently sufficient to produce convulsions. The earlier these conditions are attended to surgically, the better will be the after-results.

In fractures of the base of the skull, for more than two

years, where the condition of the patient seems to warrant, drainage has been instituted in our practice. Formerly, it was taught that fracture at the base of the skull was an inoperable condition, but in a number of instances such favorable results have been obtained, particularly in those where the brain substance has not already been damaged, that we have looked upon drainage as the proper thing. In doubtful cases, where exploratory operation is indicated, it is best to have sufficient room for ample exploration, and by means of osteoplastic operation, such as is usually performed for decompressive purposes, satisfactory results may be obtained.

REPORT OF A CASE OF URETHRAL TRANSPLANTATION.

By J. D. S. Davis, M.D.,
Birmingham, Alabama.

On May 6, 1907, I made a preliminary report on the operation for transplanting a section of calf's urethra (four inches) before the Jefferson County Medical Society of Birmingham.

I am now making a final report of the case, as the patient has gotten entirely well.

In January, 1907, Wm. H. (colored), of Epes, Alabama, was brought to my clinic at Hillman Hospital, suffering from a sloughing scrotum and perineum, prostatic obstruction, cystitis and overdistention of the bladder. The man was almost pulseless from the prostration due to infection and repeated hemorrhages following catheterization efforts.

My assistant, Dr. E. P. Hogan, who was unable to catheterize him, tapped his bladder with a trocar and removed a large sloughing mass of scrotal and perineal tissue, including the membranous and the first part of the pendulous urethra leaving both testicles bare. Capillary hemorrhages were severe, and could not be controlled by hot sponge packs. A dry perineal pack was applied and fastened by means of a T-bandage, which in time controlled the oozing. He was at this time so near dead that I felt that there was no hope for his life.

His limbs were elevated and bandaged. Large doses of adrenalin in saline solution were given frequently—every second hour. Two-grain doses of sparteine sulphate were

given every second hour. One fifteenth grain of strychnine was administered at once and one-thirtieth grain thereafter with every second dose of sparteine. Blood transfusion was indicated, and I desired much to give him the advantage of a transfusion, but a donor could not be had.

The perineal pack could not be removed for seventy-two hours without return of the distressing capillary hemorrhage. The patient gradually improved. The epicystic opening was allowed to close, as the patient could pretty well empty the bladder through the multiple fistulæ.

Fifteen days later the patient began to suffer so much with his bladder that I did an epicystotomy without an anesthetic and passed a catheter through the prostatic urethra from the bladder end, but could not bring the end out until I had cut through the dense cicatrix stretched over the projecting catheter. The prostatic urethra was then dilated sufficiently to admit a (No. 40 F.) sound.

A syphon drainage was kept in bladder through suprapubic opening for a few days, and the bladder irrigated three times daily with boric acid solution. Rapid improvement soon began, and April 1, 1907, he was given an anesthetic for the purpose of dissecting out the dense cicatrix, raising lateral skin flaps to cover the testicles and repairing his urethra by transplanting a section of a calf's urethra.

A young calf was killed by my butchers at 4 A.M., and its entire urethra and bladder was dissected out and put in cold normal salt solution and sent to the hospital to be used at 8.30 A.M. I was detained in an important emergency case and did not reach the hospital until my regular clinic hour—2 P.M., ten hours after the calf was killed. The calf's bladder contained about eight ounces of urine when, at 2 P.M., I received it for removing a four-inch segment for transplanting.

I sent two of my internes, Harris and Lanier, to make the dissection from the calf under sterile precautions, but they did not reach the slaughter house before the butcher had removed the specimen.

Just before the patient was etherized I dissected out four inches of the bladder end of the urethra, stripped it of all muscular covering to the spongiosum, and dropped it in a basin containing cold sterile normal salt water.

When I had the field ready, I passed a rigid rubber catheter (No. 30 F.) through the pendulous urethra, through the four inches of the calf's urethra, and then through the prostatic urethra into the bladder. The tip of the bladder end of the catheter was caught with forceps and brought out through the suprapubic opening sufficiently to permit a suture of worm gut to be passed through it and attached to cutaneous margin of suprapubic opening in such a way as to allow the end of the catheter to rest in the bladder anchored to the skin. The bladder was again irrigated with a warm normal salt solution, and a suprapubic syphon drainage tube was placed in the bladder. The transplanted urethra was attached first by four interrupted No. 3 chromicized catgut sutures to the prostatic urethra. The distal end was in the same manner attached to the pendulous urethra. The transplanted urethra was covered by the skin that had been dissected out in such a manner as to permit covering the urethra and the testicles. The wound was dressed with sterile gauze and cotton moistened with sublimate solution 1 to 4000.

The bladder was irrigated daily through the suprapubic incision, and the dressing over perineal wound changed daily. The catheter was removed by accident on the fifth day, and I had considerable difficulty in getting it back into the bladder. As the result of this accident, in part at least, a fistula resulted at the pendulous or distal approximation.

On the tenth day the catheter was removed. The suprapubic syphon drainage was discarded on this date, and a No. 20 (F.) sound was then passed. The sound was used daily for five times, and then every second day for six times.

Twenty one days after the operation I made an unsuccessful effort to repair or close the fistula at pendulous juncture. At the same time I removed a small segment for examination.

Dr. McLester made the histological examination of the resected segment of urethra and found no changes.

Though the technique was somewhat faulty, the immediate and remote results have been satisfactory.

Dr. Cook, who sent the patient to my clinic and has seen him constantly, told me last week that the man was entirely well, the fistula having closed over a year ago.

DISCUSSION.

Dr. Arthur Dean Bevan, of Chicago.—One little point in technique which I have employed in several cases recently in connection with fistula about the urethra has impressed me as being of considerable value. I do not know that it is original with me. It is the closing of this fistula in the urethra a good deal as we would invaginate the stump of the appendix. I have had two fistulæ in which we have used this idea. The fistulæ were in the pendulous urethra and the membraneous urethra, and in both almost all the urine was passed through the fistula and not through the meatus. An operation was done of simply cutting around the fistula, dissecting it out as you would dissect out the appendix, until you reach the normal urethra, then cutting it off short, leaving about one-quarter of an inch of stump, outside of this putting in a purse-string suture and invaginating the stump of this fistula toward the urethra, just as you would invaginate a short stump of the appendix. Over the purse-string suture of fine gut we have placed one or two more purse-string sutures, in the same way, to close the dead space, closing the external opening by ordinary horsehair sutures. In these two cases the results were so satisfactory that it seemed worth while in this connection to mention that simple technique in closing urethral fistula.

FRACTURES OF THE ELBOW-JOINT.

By Robert Carothers, M.D.,
Cincinnati, Ohio.

A permanently stiff elbow-joint, following an injury, is certainly a grave disability to carry through life. To prevent such a complication and to restore the injured joint to usefulness is, if possible, the result to be sought in all cases. A thorough discussion of the above title would consume far more time than is allotted to it on this program, therefore, I have selected three points for consideration:

1. The importance of a correct diagnosis.
2. Correct apposition and maintenance of the fragments.
3. Early passive motion.

A diagnosis is based upon the physical signs present and confirmed by *x*-ray plates made at right angles to each other of the injured elbow. Before this body of surgeons a lengthy discourse on the physical signs of an injured elbow-joint would be inappropriate.

At the present time, when diagnostic aids are so much perfected, one would be looked upon as being, to say the least, quite unscientific who would attempt to give a final decision in the diagnosis of an elbow injury without calling to his assistance *x*-ray plates of the injured elbow. In those hospitals where it is a routine practice to have *x*-ray examinations made of injuries, it is surprising how much of interest has been discovered and how different things have been found after a careful and painstaking physical diagnosis, in the hands of an expert, has been made. On the other hand, it is as equally

misleading to try to make a diagnosis of an injured elbow-joint from the *x*-ray plate alone. The experienced do not attempt it. It is the careful study of the case that counts—the cause of the accident, the age, comparison of the injured with the uninjured elbow, and then an elucidation of any and all the signs of fracture, and especially as applied to the location under consideration. After this evidence has been obtained, with a careful study of the *x*-ray plates one is able to arrive at a diagnosis which is not alone complete, but likewise scientific.

A patient may have a chill, fever, and sweat every other day, and in all probability the case is that of malaria; but where is the careful, scientific internist today, who, in such a case, would be satisfied until the microscope had made known a plasmodia malaria?

Since these injuries occur with such frequency in childhood, in reading an *x*-ray plate in such a case one must have in mind the ossifying centres in the immediate neighborhood of the elbow-joint, and not be misled thereby. The elbow of a two-year-old would look as if there might have been an excision of the joint. At ten it would not be difficult to persuade the uninitiated that many fractures existed or that the joint was full of foreign bodies. At eighteen the joint would look as normal as in the adult. Prof. Rotch and Dr. George, of Boston, have done much research work along this line, and many interesting suggestions by them have been made. I cannot lay enough stress upon the *x*-ray examination of fractured elbow-joints, for a diagnosis otherwise made is a guess at the best.

If a hinge is to work smoothly, without friction or clogging, the component parts of the hinge must be in correct apposition. The elbow is a hinge joint, and is not an exception to this mechanical proposition. The importance, then, of a correct diagnosis when this joint is disturbed, that a correct apposition of the fragments may be made.

The most frequent fractures of the elbow-joint are the

internal or external condyle, the lower end of the humerus, epiphyseal separation, Y-shaped or T-shaped fractures, olecranon, and head or neck of the radius. Experience has taught the author that the following methods are the best to effect apposition and maintenance of these fractures, which has been proved by physical signs, or better *x*-ray plates.

In the case of a detached external condyle, apposition by manipulation and maintenance by adhesive plaster splints, with traction and a plaster-of-Paris bandage for protection, the forearm semiflexed and pronated, is, in the majority of cases, all that is to be advised. In some intractable cases it becomes necessary to nail the intractable condyle to the body of the bone. When the fragment is displaced and rotated, correct apposition being impossible, a complete removal of the misplaced fragment is advisable.

An epiphyseal separation, a fracture of the lower end of the humerus, the line of fracture from above downward and from behind forward, and the misplaced fragment being upward and backward also in the T-shaped and Y-shaped fractures, apposition is best affected by first extension, then traction of the fragment, and lastly extreme flexion of the forearm. Maintenance is secured by a plaster-of-Paris splint which will insure overflexion of the forearm. In such a position the triceps muscle and tendon become a natural splint, and so long as the forearm is in extreme flexion slipping of the fragments is impossible.

The exception to this rule is in cases where the lower fragment is found forward and the line of break almost transverse. These cases, fortunately, are rare. Manipulation in the opposite direction would be necessary, and maintenance is affected by continued traction, the forearm in a semiflexed position and the injured joint protected by a plaster-of-Paris dressing.

A fractured olecranon is in so many cases surgical that if one's technique is safe the end results will be best to regard it as operative in all cases. The operation is performed at

about the end of the first week, the bone united by wire or aluminum bronze and the soft parts by an absorbable suture material, preferably common catgut.

In the so-called chisel fractures of the head of the radius the repair is usually with so much callous and impairment to function of the joint that it is advisable, unless for some good reason contra-indicated, to remove the broken fragment.

In the fractures of the neck of the radius, which are fortunately rare, the best results will be obtained by making apposition, which ordinarily is easy, by manipulation and maintaining the same with the forearm in a semiflexed position, to overcome a possible displacement by the biceps.

The first week of a fractured elbow is uneventful beyond the symptomatic treatment which may arise. There is a traumatic inflammation of the neighboring parts which effects a union of the broken bone and also by its plastic lymph an ankylosed or stiff elbow-joint.

To prevent a permanence of this stiffness on about the eighth to the tenth day the dressings are temporarily removed, and passive motion, with massage of the joint, is commenced. This is continued, slightly increasing the amount of motion each day, until the eighteenth or twentieth day, when all dressings are discarded, and active as well as passive motion is advised.

Active hyperemia through the baking machine not only relieves pain, but likewise assists passive motion and massage in obtaining the desired result—free motion of the injured joint.

DISCUSSION.

Dr. C. E. Caldwell, of Cincinnati, Ohio.—From considerable experience with fractures of the elbow-joint in children, it seems to me that it is very difficult to get any other than good results, so far as function is concerned, in the elbow-joint, no matter how much of an injury you may have. I have seen many cases where there was apparently

such injury to the elbow-joint that an unfavorable prognosis was made as regards function. One of these children, a boy aged four years, fell from a grape arbor on to a concrete pavement, and comminuted his elbow badly, the lower extremity of the humerus almost perforating the skin, having passed through the lower portion of the biceps. This case, much to my astonishment, although there was enormous contusion and swelling of the elbow, after being put up in a firmly flexed position, after having applied cold compresses to the arm for two days to reduce the enormous extravasation, got a perfect result so far as function is concerned.

I could enumerate many other instances where, as a result of extreme injuries to the elbow, nothing more than a slight gun-stock deformity ensued, but with a perfect result so far as supination and pronation are concerned. My prognosis in these cases is more favorable the more I see of them in young children. As we go on and get to the point of epiphyseal union, injuries of the elbow become much more serious. As to the danger of ankylosis in adults, we have a very much greater number than in children. In this connection it is very interesting perhaps to refer to the experiments of Lexer and Buchmann, with regard to the transplantation of joints. The most remarkable thing I read recently was Buchmann's transplantation of the metatarsophalangeal joint in a boy with complete ankylosis of the elbow. Resection was made, with transplantation of the metatarsophalangeal joint of the great toe into the elbow, with good union and good movement. This offers to us in the future a most remarkable and interesting page of experimental investigation, and Lexer has transplanted a complete knee-joint from the amputated limb into an ankylosed knee, after resection, with very good results, the medulla having been previously curetted and filled with iodoform bone paste to prevent the danger of medullary necrosis. I speak of this in connection with the possible after-results of these cases, in which there is ankylosis, and I am sure we shall look forward in this country to the first man who will repeat and report these experiments.

Dr. James E. Thompson, of Galveston, Texas.—I have listened to this paper with a great deal of pleasure and there are certain points in connection with it about which I should

like to say a few words. In fractures of the elbow-joint immediately above the lower end of the humerus, which are usually spoken of as transverse fractures, the usual deformity found is that the lower fragment is displaced upward and backward. In the early stages of treatment this fragment is capable of being brought into its normal position with very little trouble, but if the case is not seen for six or eight hours it often happens that the lower fragments cannot be brought into contact with the upper fragment, even after the use of extreme force. The exact cause of this inability to bring the fragments into contact is not thoroughly understood by the profession at large. I belive the explanation brought forward by Mr. Lane is a true one, which is, that the cause of our inability to reduce the displacement is due to the presence of blood. In other words, that an extravasation of considerable size has occurred between the fractured ends that mechanically prevents the fragments from being brought together. This has been verified frequently by Lane and I have personally seen a number of cases that bring out this point. About a year and a half ago a fracture of this nature occurred in my own son, a boy aged eight years. I saw him within half an hour after the injury and without any difficulty, under an anesthetic, I replaced the fragments in accurate apposition. At this time there was neither swelling nor hemorrhage. I put the limb in a forced flexed position, using a posterior trough splint of plaster-of-Paris carefully molded to the parts. During the first night I yielded to the entreaties of the boy on account of the appearance of a severe degree of edema and swelling and cut the bandage in front, which bound the plaster-of-Paris splint to the limb. The result was that the arm came out of the splint very much like an orange seed can be squeezed from between the finger tips. The swelling was enormous and was evidently caused by the large extravasation of blood, as was shown later by the extreme degree of pigmentation. An *x*-ray picture of this case showed that the lower fragment had slipped upward and backward to an alarming degree. Reduction was attempted under an anesthetic but without avail. At the end of a week, at which time the swelling had materially diminished, under an anesthetic reduction was attempted again. Although it was possible to mold the fragments somewhat they could not

be brought into contact and I was forced to leave the matter alone. Still, in spite of this fact, the return of function has been very good. At the present time flexion is possible to a high degree and extension is perfect. The explanation of this return of function is very interesting. The provisional callus and the projecting anterior portion of the upper fragment become absorbed as time passes. The provisional callus on the posterior portion of the bone, uniting the upper and lower fragments together, develops into a new shaft, owing to the alteration of the lines of force, which pass along the limb in this direction. This point has been well demonstrated by Lane and I am able to show the same thing occurring gradually in the case mentioned above.

Dr. R. M. Cunningham, of Ensley, Ala.—With reference to fractures of the elbow, I am inclined to believe that it can be truthfully said a perfect result is very rarely obtained. I want to call attention to an analogy in the reduction of a supracondyloid fracture of the humerus and Pilcher's method of reduction of a Colles' fracture. The only way it can be reduced is by forced extension applied in the manner I show you (indicating), then bring it out into flexion, pushing the fragments into place, and it is easy. The way to reduce the kind of fracture under discussion is to do it on the same principle. The aim should be to over-reduce it and, if possible, bring a part of the lower fragment anterior to the upper fragment. This is the only ununited fracture we have had in our experience. I have had some bad results from treating these fractures, but never had one ununited, and while I am not a subscriber to the school of thought that treats all fractures by the open method, I made up my mind to treat them in that manner until I read a description of this treatment in the *Journal of the American Medical Association*. This method, in my judgment, will give the best results.

Let me say a word or two with regard to the complication of dislocation of the radius with fracture of the neck. Clinically, it is impossible to make that out by physical signs, and any one of you may be confronted by such a thing some day and get a damage suit instituted against you. Without the use of the *x*-rays I do not believe that a diagnosis can be made. Swelling disguises the deformity of the dislocation.

The rotation of the radius will be at the seat of fracture; you will get crepitus, and the head of the bone will not roll between your fingers, and that mistake has been made and will be made again, without the *x*-rays. I cite that merely to emphasize the point made by the essayist that an examination of an elbow-joint is not complete without the use of the *x*-rays.

Dr. Edward H. Ochsner, of Chicago.—I want to call attention to a little point in the treatment of fractures of the elbow that I have found very useful, namely, to substitute subconscious active motion for passive motion. Take for instance a little boy who has sustained a severe injury of the elbow, and if you try to overcome the rigidity by passive motion there is sure to be trouble not only for the boy, but for the relatives and doctor as well. I remember one little fellow ten years of age who was brought to me about a year ago, who had been treated for several weeks by passive motion until the mother was no longer able to take him to the office because of the struggling and crying that took place each time as soon as she came within two blocks of the doctor's office. All of this trouble was avoided by giving the boy a wheelbarrow and a sand and stone pile. The ease and rapidity with which this boy worked his arm out is but one illustration of a considerable number of similar cases that I have had. The explanation why this works so well is to be found in the fact that the muscles are relaxed while the weight is applied. If active motion is employed the muscles instantly become rigid, which must necessarily greatly increase the pain and suffering. If one of these severe elbow-joint injuries comes to me I put up the elbow in extreme flexion, leaving the cast in place three or four weeks, then I make a removable splint of this same cast, applying it nights and letting the boy work out the arm in the day time. The greatest danger in these cases of severe elbow-joint injury is to get a straight, ankylosed elbow which leaves an almost useless extremity. By following the above method I have always been able to secure a useful extremity with fair motion.

Dr. William D. Haggard, of Nashville.—I would like to say that Mr. Jones, of Liverpool, one of the best orthopedists in England, and an authority on the treatment of fractures, treats all of his cases of fractures of the elbow

in children with the simple device spoken of by Dr. Ochsner. He has a little leather wrist-band and a leather collar, which are held together with a strap. Everything is gotten out of the way ready for flexion to take place. Having a splint on every night, and this device in the daytime, is an excellent combination. For the general practitioner, who does not use the *x*-rays, it is the best single method of treatment in fractures of the elbow-joint.

Dr. Carothers (closing).—First, I want to thank the gentlemen who have so freely discussed my paper. I am particularly thankful to Dr. Thompson for what he has said, and for the pretty picture he has drawn. I think it illustrates my case exactly, as I know the difficulty of getting apposition of the fragments after these cases have been neglected. In the little one I did not see for six days after the receipt of the injury, it was impossible to get any kind of good result, but I think in the long run I will get a good result in this case. In two or three years I believe the child will have a very good elbow-joint.

The comparison that was made by Dr. Cunningham of fracture of the elbow with the so-called Colles' fracture, is a very good one. I would not give that (snapping his finger) for an opinion in a case of injury of the elbow-joint without an *x*-ray plate. It is of no value unless you have *x*-ray plates.

Dr. Ochsner's idea is an excellent one. I am partial to active motion for these little fellows. It is a good thing if you get them out of the dressing pretty early, as from the second and third week the dressings can be removed, when good active motion is better than passive motion, although the latter is to be used.

SUPRAPUBIC PROSTATECTOMY.

By Arthur Dean Bevan, M.D.,
Chicago, Illinois.

During the last ten years the subject of prostatectomy has been very carefully worked over by general surgeons and surgical specialists and most gratifying results have been obtained. One feature, which has marked this developemnt, has been the extreme partisanship of the advocates of the various methods which have been devised.

This extreme partisanship had been shown especially by the surgical specialists, the genito-urinary surgeons, who have gone extensively into this work; the general surgeons have, however, not been entirely free from this fault. This partisanship of some special method has been carried so far that it has become ludicrous. One genito-urinary specialist recently informed a friend of mine that by his special method he had reduced the mortality of perineal prostatectomy to *nil* and that he would regard it as criminal for him to do a suprapubic operation for the removal of the prostate.

This extreme partisanship has, I believe, led to the juggling of statistics in the effort to prove the greater safety of some preferred method and we find in some of our best journals and text-books on surgery articles seeking to prove that some special method of prostatectomy carries with it no danger or about the same amount of danger as having a tooth pulled, possibly a little more than having a shave or a hair-cut. Some of the articles remind one of the street fakir calling loudly the value of his wares. There can be no doubt but that

splendid results are being obtained by several methods and that considering the age and general condition of the patients upon whom the operation is performed, the mortality is surprisingly low. It is, however, clearly not in the interests of scientific progress or truth to belittle the seriousness of the condition demanding the operation of prostatectomy and the gravity of any radical surgical procedure in the face of such conditions.

As a general surgeon, I have watched the development of this work with much interest. I have run the usual gamut of suprapubic and perineal drainage, castration, vasectomy, prostatotomy, partial prostatectomy, perineal prostatectomy, with free exposure of the prostate, perineal prostatectomy with midperineal incision, and intra-urethral enucleation, and suprapubic prostatectomy. I, at one time, thought that I had discovered a new operation in what I called the intra-urethral perineal enucleation of the prostate, but a review of the literature soon convinced me that Gouley, Goodfellow, and others had done this years before. I have no new operation to present to you. I should like to, however, attempt to briefly review the present status of the operation of prostatectomy and attempt in a non-partisan way to present the conclusions which have forced themselves upon me from my own work.

In this discussion I shall consider three operations: Suprapubic enucleation, the operation of Fuller, of New York, which has been claimed and enthusiastically advocated by Freyer, of England; the perineal intra-urethral operation of Gouley, Goodfellow, and others; the perineal removal of gland through the external capsule and not through the urethra, of Morris and the French surgeons, notably Abarian, De Pezzer, and later popularized especially by Young in this country.

Excellent results have been obtained by each one of these methods and each has its enthusiastic advocates. In analyzing the advantages and disadvantages of each method I submit the following:

The suprapubic enucleation has the widest field of usefulness. It is practically applicable to all cases of prostatic hypertrophy in which a prostatectomy is indicated; it gives full and complete information of not only the prostate but the bladder and its contents; it does not injure or interfere with the musculature and nerve supply of the perineum and structures controlling continence; it carries with it little risk of injury to the rectum; it is seldom followed by incontinence, fistula, or stricture. Disadvantages claimed against it are greater mortality and necessity of longer residence in hospital.

Narath, in reporting the prostatectomies done last year in the Heidelberg clinic, 14 without a death, comes to quite the opposite conclusion and says the more severe and more dangerous operation of perineal prostatectomy has been entirely abandoned.

The intra-urethral perineal prostatectomy is very much the same procedure as suprapubic prostatectomy, the tumor-like masses are removed after boring through the mucosa of the prostatic urethra by the finger introduced through an external urethrotomy incision. The advantages claimed are low mortality, good drainage, and rapid operating. The disadvantages are, that the membranous urethra and, to a certain extent, the musculature of the perineum are injured; that one does not obtain a complete knowledge of bladder and contents; that there is a possibility of injury of the rectum; that incontinence, fistula, and stricture occasionally result, and the advocates of the wide exposure of the prostate by the perineal route claim that it is an operation done in the dark. The advocates of this method offset this statement with the answer that the eye in the educated index finger can be relied upon as much as the eyes in one's head.

The perineal prostatectomy with wide exposure and removal of prostate masses through one or two incisions through the capsule claim that this is the conservative method, that by this operation the seminal ducts and function can be

saved, that hemorrhage can be better controlled, and as opposed to the suprapubic operation the mortality is less, and as opposed to the intra-urethral perineal operation it is an operation done under the guidance of the eye and not a blind procedure.

The disadvantages claimed against it are that it is a more formidable dissection, that there is extensive injury to the musculature and nerve supply of the perineum, that incontinence, fistulæ, stricture, and injury of the rectum are more apt to occur after this operation than the suprapubic.

My own conclusions are these, that the V-shaped or Y-shaped incision into the perineum with free exposure of the external capsule of the prostate and dissection of the prostatic masses through incision, through the capsule, is an unnecessary traumatism. Seeing the actual operation or photographs taken of the various steps of the operation on the living subject, give one a much better idea of the wide dissection and the extent of the traumatism than is obtained from the more or less diagramatic plates of the steps of the operation, which are usually shown.

As example, compare the diagrammatic plates of Young to the photographs of Pilcher on the living subject in April, 1905, of *Annals of Surgery*. An anatomical study of hypertrophied prostates show that the tumor masses to be removed are much nearer the mucous membrane of the bladder and urethra than to the external surface of the capsule, and further, that they can be reached much easier and with less injury to bloodvessels through the mucosa of bladder and urethra than through an incision in the extrenal capsules.

The term conservative, as applied to this operation, seems not to be deserves if it is from the standpoint of traumatism. Its only claim could be to the saving of the ejaculatory ducts, and here there is certainly no evidence that these are less apt to be injured by this method than a carefully performed intra-urethral or suprapubic prostatectomy, where the prostatic masses are removed in two or more pieces, that is, where the lateral lobes are removed separately.

The Intra-urethral Method. From an anatomical standpoint, except for the fact that the operation must be done by touch instead of sight, the simple straight perineal incision into the membranous urethra through the central raphé is much to be preferred to the inverted V-shaped or Y-shaped incisions. The incision in the raphé injures to the least possible extent the musculature, the vessels and the nerve supply of the perineum. The operation can be done rapidly, the drainage is good. There is less danger of infection and urinary infiltration than in the more extensive dissection.

There are, however, certain objections. One cannot obtain a full knowledge of the bladder and contents and with massive projections of the prostate in the bladder, enucleation may be difficult.

The suprapubic route is, to my mind, the route most generally applicable. The operation can be rapidly performed. The entire bladder and contents at once examined with finger, stones of any size removed, a more accurate differential diagnosis between simple hypertrophy and carcinoma determined, and any enlargement of the prostate which legitimately demands removal removed.

There is no injury done to the musculature or nerve supply of the perineum. There is little danger of injury to the rectum. There is little probability of resulting incontinence, fistula, or stricture. As a whole, the cure is more complete and satisfactory than after a perineal prostatectomy.

The only valid argument which can be brought forward against the operation is the one which is generally urged by the advocates of perineal prostatectomy, *i. e.*, that the suprapubic prostatectomy carries a larger risk than does the perineal operation. If it is true that the advocates of the perineal method have reduced the mortality to *nil*, then this would have to be admitted, but this I do not believe. I agree with Narath, of the Heidelberg clinic, that the suprapubic is less dangerous and a less formidable operation than the extensive perineal dissection. I do not, however, believe that it is

any less dangerous than the midperineal prostatectomy. I believe, however, that it is more satisfactory, on the whole, and that it can be made as safe.

In a broad, clinical way cases of enlarged prostate should be divided into three groups:

1. Simple enlarged prostate without complications.
2. Enlarged prostate with complications, stone, bladder infection, sepsis, etc.
3. Enlarged prostate due to carcinoma.

In the latter class, *i. e.*, carcinoma, I believe, that no radical operation should be attempted, except in a few rare cases where the carcinoma is so limited that an operation gives fair prospect of cure. As a rule, the diagnosis of carcinoma of the prostate can be determined by the rectal examination with almost the same certainty that rectal carcinoma can be determined by the experienced finger. Simple hypertrophies seldom give the cartilage or bone-ilke hardness of carcinoma and with some study of cases comparing the simple hypertrophy with the carcinoma, the finger learns to detect malignant disease.

These cases, with a few exceptions, are best treated with catheter and morphin occasionally with a suprapubic drainage and in the rare case by a radical extirpation through the transperitoneal route.

The cases of simple hypertrophy without complications are, after a careful analysis of all facts and thorough preparation, submitted at once to radical operotion. The patient is placed flat upon the operating table. I can see no advantage in the Trendelenburg position in suprapubic prostatectomy.

The bladder is emptied and washed out with hot boric solution and left filled with as much as the patient can comfortably stand. In the straight, uncomplicated case no cystoscopic examination is made.

The patient is anesthetized with nitrous oxide gas. The usual suprapubic cystotomy is made. The thumb, index and middle finger of the left hand are introduced into the rectum and

the prostate crowded up toward the pubis. The index finger of the gloved right hand is introduced into the cystotomy incision, the interior of the bladder is explored. If stones are present they are at once removed; the index finger then bores through the mucosa, over the most prominent lateral lobe and the prostatic tumor of that side shelled out, the same is then done on the opposite side, the middle lobe being usually removed with one or the other of the lateral lobes. In cases where the tumor masses can not be shelled out of the capsule in this way it is, as a rule, best to remove the prostate *en masse* with the prostatic urethra. A rubber tube the size of the index finger is then placed in the bladder and allowed to project not more than one inch and is sewed in place by a very fine catgut stitch, which passes through first one side of bladder incision, through the tube and then through the other side. The laparotomy incision is closed by two or three silkworm-gut stitches. A cigarette drain is introduced into the lower angle of the wound down to the bladder. No gauze packing or irrigation is employed. The abdomen about the incision is covered with stiff oxide of zinc paste, and a copious gauze dressing applied. The entire operation can be done, as a rule, in ten minutes and the patient is wide awake as the dressing is applied. The after-treatment is simple. The cigarette drain is removed at the end of twenty-four hours and the tube usually in about three days; the stitches at the end of eight days, and the patient is about on a wheel chair at the end of a week or ten days. The suprapubic wound is, as a rule, closed in twenty days.

In the third class of cases, *i. e.*, hypertrophy of prostate with complications, infection, sepsis, etc., what should be the treatment? I believe that here, especially when the patient's condition is bad, that a two-step procedure under nitrous oxide anesthesia offers many advantages. The first operation being a suprapubic drainage, and, of course, a careful exploration of the bladder with the removal of stones if they are present. This drainage should be maintained until the infec-

tion has subsided and the patient's condition warrants a radical removal of the prostate. The second operation should also be done under nitrous oxide anesthesia, and this can be done, as a rule, without any instruments, simply with the gloved finger.

In this second operation no drainage tube is inserted and no irrigation employed. The wound is simply dressed frequently with copious gauze pads to absorb the urine and the skin of the lower abdomen protected with zinc paste.

I believe that following out these general rules of dividing the cases of enlarged prostate into three distinct groups: Carcinoma, simple enlargement, and enlarged prostates with complication, and handling them accordingly, *i. e.*, the carcinoma by palliative measures, the simple hypertrophies without complications with immediate suprapubic prostatectomy under gas, and the hypertrophies with infection and complications by first suprapubic drainage and later, if conditions warrant, by suprapubic prostatectomy, also under gas, that the best results can be obtained both from the standpoint of low mortality and completeness of the cure. I believe that, as a rule, the cure is more complete and satisfactory after suprapubic than after perineal prostatectomy.

I feel quite confident that there are fewer complications, such as incontinence, fistula, and stricture, after the suprapubic than after the perineal operation. Will there be any deaths? Yes, certainly. There will be some deaths from lung complications, even though such an innocuous agent as nitrous oxide is employed, and more, of course, if ether or chloroform is used. There will be some deaths from hemorrhage and shock, especially in the cases which were thought to be benign but are found at operation or under the microscope to be malignant. There will be some deaths from kidney insufficiency and suppression of urine. There will be some deaths from infection. What is the mortality rate? My impressions are that in a large series of cases done by competent men it will be somewhere from 5 per cent. to

10 per cent. In discussing the advisability of an operation with an intelligent patient I think that it would be fair to give him to understand that he ran somewhere in the neighborhood of 10 per cent. of risk if he had his enlarged prostate removed. I do not think that it would be fair to state to him that by any method the operation could be done with trifling risk. It is not my intention to belittle in any way the various operations of perineal prostatectomy or the excellent work done by the surgeons advocating this route; I present this brief paper rather as an attempt to arrive at an unbiased conclusion after a trial of practically all the methods which have been advocated.

DISCUSSION.

Dr. J. Garland Sherrill, of Louisville, Kentucky.—I think Dr. Bevan has about expressed the opinion of the profession at large in reference to prostatectomy. Some time ago I published in a journal, issued in this city, my views on this subject. While my experience has not been as wide as some of the surgeons here in handling this class of cases, still I have had experience with the different methods of operating, and admitting that there is a slightly greater mortality from the suprapubic method, I am firmly convinced that the end results following operations performed by this method are better than by any other, and I want to emphasize that point in Dr. Bevan's paper. It seems to me that men who are doing a special line of work are likely to adopt a certain plan of procedure, whereas the general surgeon goes through carefully each form of operation and tries to select the one that is best. The effect of the operation upon the testicle, that is, the epididymitis, which occurs following the inferior method, is certainly more serious than the suprapubic operation.

There is one class of cases in which the suprapubic operation is especially indicated, and that is the class in which there is but little or no infection, and that is the condition in which we all like to see the bladder when operation is performed by any method, and I believe that in these cases the time will come when we shall see the bladder sutured pri-

marily, with no drainage above the pubes—the drainage that is necessary will be obtained by a retained instrument, and we will get first-class results. I have attempted this procedure in two cases and have been able to get the patients up on the second day, but in each case had a leak, the suturing being imperfect, but even then drainage was effected as readily as through the perineum. Mr. Freyer drains through a tube three-quarters of an inch in diameter, and his assistant has devised a means to get rid of the fluid as it comes out. If we can close the bladder after wounding it, we have arrived at a point where we can obtain fair success. In operating above the pubic bone, we will find great advantage to be obtained by having in a catheter at the time of the operation, and this catheter enables you to map out accurately the amount of cleavage you want, to break through the mucosa, and enucleate the entire gland readily. I have used recently a very large metal catheter for this purpose and for twenty-four hours after operation to provide free drainage from the bladder.

Dr. Charles H. Mayo, of Rochester, Minn.—I have been very much interested in Dr. Bevan's paper, and I do not hesitate to say that it is the best presentation of the subject, from all standpoints, I have ever listened to. The question of why we should choose a certain operation in order to get at and remove the prostate, reminds me somewhat of a discussion that was had years ago on how we should get at and remove the uterus. If any of you were at Denver many years ago, you will recall that there was considerable discussion as to whether we should go in above or below the pubic bone, in order to take out the uterus. Now there is a place for both operations. But when the trouble begins above at that point, it is easier to get at through the abdomen. And so, if we examine the prostate with the finger in the rectum, we will find that one prostate is very close to the finger, and one can go in, reach all parts of it readily, and enucleate it perineally. Another case in which the prostate seemingly is not large, yet is placed high, may give a great deal of trouble in its enucleation. The trouble may be due to obstruction at the internal meatus, either from a prostatic bar or from a middle lobe producing the condition. If there is a complication with stone or other foreign body in the bladder, if it is septic, it is good surgery to enucleate

the prostate from above. I do not believe in boring through the bladder wall in the outer or upper lip of these prominent lobes of the prostate that the essayist speaks of, but in a perineal or suprapubic operation we go in and shell out the prostate, saving all the anterior portion of the prostatic urethra, trying to save as much of the urethra as would line a young man's prostate.

In these cases bleeding comes from wounding the mucosa, whether you go in from above or below.

As to cancer, I have not cured any case of cancer that I could recognize or diagnosticate as such before operation. I have cured cases of cancer where only a part of the lobe was involved. The prostatic capsule is firm and strong. The lymphatics are few from it, so that we have the same long period of life after cancer begins in the prostate as in the large intestine. For a long period it remains a local disease, not involving the liver or other organs.

The mortality, I believe, is about as stated by Dr. Bevan. I have operated this year on a good many consecutive cases of exophthalmic goitre without a death, but I have lost two patients in one day in operating for this condition. I may have a series of cases running along successfully until I lose another bunch, so that if I report all the successful cases, and not the unsuccessful, it does harm to surgery; at any rate, it does not do either surgery or myself any good. We should not lead the laity to believe that these serious operations can be done without mortality. They cannot be done without mortality. We should not attempt to belittle serious conditions.

In elevating the prostate we can use the hand in the manner that has been described, but I have found it very convenient and advantageous to use the Linn-Thomas spoon in elevating the prostate, and before I secured that I used a table spoon of large size. The assistant can place it within the anus, and the prostate can be elevated an inch and a half with the anus, and with the aid of this instrument the prostate can be easily enucleated.

As to choice of routes for removing the enlarged prostate, we, as general surgeons, do not adhere to any one method.

Dr. Charles E. Bowers, of Wichita, Kansas.—This is the first time I have been at home in a medical society on the subject of prostatectomy. Four years ago I read a

paper before the Western Surgical and Gynecological Association, in which I reported twelve consecutive cases of suprapubic prostatectomy without a death. My first case happened to be an accident. I removed an enlarged prostate, believing it was a sarcoma, but it proved to be an hypertrophied prostate. Since then I have done forty-seven operations suprapubically for the removal of enlarged prostates. A day or two ago I abandoned the suprapubic route for the perineal in a case of carcinoma of the prostate, but did not succeed with the infrapubic route.

In studying the embryology of the prostate, we will find that the prostatic portion of the urethra belongs to the lateral wall of the bladder, and after puberty the prostate becomes a portion of the urethra, and every enlarged prostate is nothing more nor less than a projection into the bladder, and to remove it, it is just as rational to do so by the suprapubic route as it is to adopt that route in removing a stone from the bladder. I have performed forty-seven suprapubic prostatectomies, and eight minutes is the longest time I have taken from the initial incision until the prostate was enucleated. I have labored longer than that in order to remove the prostate from the bladder simply because of having followed Freyer's method through a smaller incision. In these cases I now make as large an incision as I would do for a moderate sized uterine fibroid operation, going through the fascia, and that lets the abdominal wall well down, so that I have absolutely removed the prostate with the left hand in the rectum, pushing the prostate up above the deformed abdominal wall, removing it by sight in a public clinic. But that is not true in all cases. Now trouble came later, out of these forty-seven cases I lost one, patient dying a few hours after the operation. This case proved to be one of multiple nephropyosis. One patient died from carcinoma, but the rest of them are living. Two of the patients had been operated on previously by distinguished operators in the United States, one of them an ex-President of the American Urological Association.

In my correspondence with Dr. Freyer, and from observations I have made after visiting different clinics in America, and seeing the different operators work, and among them Deaver, who has been doing this operation, I came to the conclusion that there was a mistake in resorting to partial

enucleation of the prostate. In the last twenty-one cases I have done total enucleation. I do not know but what possibly I will do partial enucleation in the future. I have operated three times where partial enucleation of the prostate has been done, and it is just as necessary to do a secondary operation as it was to do the primary operation; consequently, I believe, after getting a report from Freyer, total enucleation of the prostate will be the future operation. I believe that if we attempt to do a partial enucleation, we will leave enough of this pathological gland, or a few cells of it, sufficient to reproduce itself.

I operated on a man three years ago and removed his prostate, but who returned with a carcinomatous condition. At first, I only did a partial enucleation.

Another man, after eighteen months, returned suffering from the same symptoms that he had before, and in his case I did a partial, and not a total, enucleation. Had I done total enucleation of the prostate in these two cases, is it probable we would not have had a carcinomatous condition occurring two years later in one instance, and in the other eighteen months after primary operation?

As to the mortality, I have observed the claims set forth by the different urological societies, the members of which claim that the suprabubic route is the route *par excellence*, if it were not for the mortality. I do not know how we can get a mortality from the suprapubic route such as is claimed by these different associations. They claim it is due to prevesical infection. I never saw a prevesical infection that terminated fatally. I used to resort to suprapubic drainage, and never had fatal infection.

A few months ago I did a prostatectomy on a man whose bladder had been tapped through the abdominal wall four or five times, and the cannula at the last time allowed to remain for about ten days. He had a temperature of 104°; and was delirious at the time of operation. Such cases, seemingly, would certainly die, operated or not operated, and it would seem foolish to do anything further than establish drainage. I made up my mind that I would try the Lilienthal two-step method, open the bladder and establish drainage, and later remove the prostate. As I cut down through the prevesical tissue pus exuded. Upon opening the bladder the temptation was so great in this case to

enucleate the prostate gland that I did so, as it could be done so easily. A drainage tube was put in and left in place for eight days. The man is well, and has left the hospital. So far I have never seen a fatal case from prevesical infection.

Dr. Bransford Lewis, of St. Louis, Mo.—I must acknowledge my intense interest and appreciation of both Dr. Bevan's paper and the discussions. I am in accord with the premises of my friend, Dr. Bevan, and I believe that there has been too restricted a position taken by a large number of the profession, particularly by those who have been in the habit of doing one particular operation for prostatic hypertrophy. I cannot agree with Dr. Bevan, however, in attributing this position solely to genito-urinary surgeons. It seems to me the facts do not justify such a conclusion. For instance, I understand that Dr. Deaver does the suprapubic altogether; Dr. Ferguson, of Chicago, is wedded to the perineal operation; Dr. Lilienthal, on the other hand, resorts to the suprapubic nearly altogether. I do not think we should become hidebound to any one procedure. Some of the gentlemen have been talking about the easiest way of operating on these cases, and how they can put themselves in the easiest position, whether it be by the suprapubic or by the perineal method. That is an erroneous standpoint from which to argue. They ought to argue from the side of comfort and benefit to the patient, and when they do that, they will occupy a catholic, broad-minded attitude. We know that gentlemen who do the suprapubic operation attain great success by that method, and we know, too, those who resort to the perineal route are also wonderfully successful. Either operation may be executed with success, and followed by good results. It is the comfort of the patient we must look out for. While I personally do both operations, my preference is for the perineal, because of the more prompt and comfortable convalescence and the smaller mortality it involves.

Dr. Bowers has stated that he does not know why there is a greater mortality connected with the suprapubic than the perineal route; but the facts are that it does give a greater mortality, and that is very important for us in making a choice of operation. I was one of the earliest to utter an emphatic protest against a narrow-minded view in this matter in a paper which I read before the Association of

Genito-urinary Surgeons in 1901, arguing that a broad guage position ought to be taken; that suprapubic prostatectomy was the procedure in certain cases in which it was indicated; that perineal prostatectomy was correct, and the operation was appropriate in certain other cases; that electro-incision or cauterization was appropriate in others, and that we must not make every patient conform to our biased ideas on the subject. If we were to go into details of the arguments, it would take a long time.

Following the perineal operation you can provide for prompt and complete drainage, which does not require the zinc paste of Dr. Bevan, and, I must say, if I had that running over my belly I think I would have a grudge against the doctor that provided such an uncomfortable mess.

Finally, in brief, I do not think we should advocate any one operation to the exclusion of others, and in considering this subject from a broad standpoint, we ought to think more of the comfort of the patient than of ourselves in deciding on the particular procedure.

Dr. Miles F. Porter, of Fort Wayne, Ind.—First, I want to refer to Dr. Lewis' objection to the suprapubic operation, that urine runs over the belly. No surgeon should do a suprapubic operation and let the patient's urine run over the belly, because he can drain it out with tube and keep the individual as dry as he would be if the perineal method had been used.

I think Dr. Bevan has put the mortality rate of prostatectomy too high. In the early part of this year I collected more than five hundred cases of prostatectomy, the operations having been done by fourteen or fifteen different operators, and putting all the deaths together, I could only make a death rate of 7 per cent. Of this number, there were ten due to such conditions, for instance, as cancer, and some due to pneumonia, and conditions of that kind, which will attend any operation, and many of them would attend no operation. All told, the mortality is only 7 per cent. I think it is objectionable to place the death rate as high as this, for the reason that it is not correct. It is not correct to say that a man with a badly damaged kidney, and the other acting badly, dies because he has had his prostate removed when, as a matter of fact, he died because of inadequate kidneys. If we get at the mortality of prostatectomy done on individuals

in shape for operation, and conclude what that is, we will begin to make more of these operations before catheter life is entered upon, and when we do that, it is my judgment the operation ought to be one with a mortality of less than 2 per cent., whether done above or below. That is my candid conviction, based on a study of a large number of cases.

I wish Dr. Vander Veer were here, as he has had a peculiar and exceedingly interesting experience in his prostatectomy work. He told me in a letter that 30 per cent. of the prostates he had removed had proved to be malignant. Personally, I have met with but one prostate that was malignant; but certain it is, this subject of malignancy should be held in mind when we are operating upon the prostate.

In a paper read a short time ago I said the time was near at hand when perhaps the majority of these cases would be operated early, before the individuals entered upon catheter life, and the operation would probably be done by the perineal route. I am rather inclined to the same opinion yet; but one of the arguments for the operation by the perineal route that is advanced by those who operate according to the method of Young and his followers is not true. As I understand, the operation as done by him and by his followers is not only done out of sight, but part of the enucleation is done with an enucleator, so in that part of the operation, at least, both the sight of the finger and sight of the eye proper are not in evidence.

I do not know why it is, but I do know this: I have done twice as many suprapubic as I have perineal operations; I do them both, I think, equally bad, but I know that my suprapubic cases make smoother recoveries. All told, they are up quicker, and they get to feeling well quicker than do the perineal cases, other things being equal. I have had, for instance, five men within the last week who passed urine through the normal channel two days after enucleation of the enlarged prostate suprapubically. On the other hand, I have seen strictures of the urethra that subsequently had to be operated on that followed the perineal operation. I have known serious injuries done to the rectum at the time of the operation by those of most experience in doing perineal prostatectomy, so that personally I am very much inclined to believe that there is room for

both of these operations; but that, generally speaking, I think the suprapubic route is the one we will find most favored at present. Possibly later, when we get these patients early, we will be removing their prostates through the perineum, and with a death rate of about that which pertains to the removal of the appendix.

Dr. Maurice H. Richardson, of Boston.—Dr. Bevan's presentation of this subject is extremely moderate and judicious, and I was particularly impressed also by the remarks of Dr. Mayo. What Dr. Bevan said made me think of the early ovariotomies and of Dr. Homans, for whom I had great admiration. In the year 1876, when I assisted Dr. Homans in operating for the removal of ovarian tumors, it was said by the Sister in charge of the hospital that she had had, in fatal cases, a great deal of trouble with the relatives of patients, who had been told that no more mortality followed an ovariotomy than followed a hair-cut. It seems to me contrary to reason, and certainly contrary to my own experience, that we can perform upon old men operations of great magnitude without great mortality. We cannot always tell beforehand what we are going to find; nor do we always know what the real condition of the kidney is. I do not believe that the estimate of mortality given by Dr. Bevan of 5 to 10 per cent. is excessive. I do not know my own mortality rate in this operation, which I have performed as a part of surgery in general, and of abdominal surgery in particular, but every now and then a patient upon whom I have operated, and who I thought would recover, has not recovered. Again, patients who we thought could not recover, have recovered.

I like to look at these cases from an anatomical point of view, as I am sure Dr. Bevan, from his long teaching of anatomy, does. He must agree with me that when we have a fibrous prostate that is encapsulated and as easily removable from its capsule as a wen, no more beautiful anatomical operation can be imagined than that of the perineal extripation. I would say this as an anatomist; but, unfortunately, it is in my experience infrequent that the prostate can be removed with this facility through the perineum. In many cases the prostate projects into the bladder when we think it does not. By the suprapubic route we have an opportunity to examine the interior of the bladder; we know

whether there is a stone encapsulated or not; we know whether there is cancer of the prostate or not; in a word, we know the pathology beyond question; and best, of all, we know what we are doing. I believe—as all anatomists, I think, believe—in operating when possible in the full light of day, by the sense of sight, aided by the sense of touch.

I was amused by Dr. Mayo's telling us how one can make his statistics good, and yet not depart from the truth, and how he could bring out a long series of thyroidectomies without a death. Dr. Homans used to say that he would perform fifty or one hundred consecutive ovariotomies without a death, and would therefore think himself a great fellow. Then, he said, almost every patient would die, and then he would consider himself a failure. By publishing only the favorable experience, omitting the deaths before and those after it, he could, if he wished, appear always to be successful. But Dr. Homans always emphasized his failures.

I like the Trendelenburg position very much for the suprapubic route, because I perform the operation by the sense of sight. I cut down upon the tumor by the sense of sight, as I would on any other abdominal tumor. My opinion is that the route should depend upon the pathology; upon the accessibility, mobility, and other attributes of the growth, as well as upon the condition of the bladder as determined by cystoscopy. A prostatectomy in cases suitable to the perineal route is one of the most beautiful and successful operations in surgery. The mortality should be the same as that of perineal lithotomy. On the other hand, when the prostate is firm, immovable and infiltrating, without definite capsule, there is great trouble attending its enucleation, whether by perineal or suprapubic route. These are the most difficult and unsatisfactory cases. By the perineum I cannot tell with the finger whether I am going into the rectum or into the abdominal cavity, and I find it difficult indeed. It seems to me that other operators must have the same difficulty. Often the tissue proves cancerous.

The views that have been expressed here by gentlemen from different parts of the country are of decided value in general surgery, and I feel well repaid for coming here and listening to what has been said. I shall go home with renewed enthusiasm, feeling sure I shall have better results,

but I do not expect ever to perform, upon old men, operations of any severity, with as small a mortality as 2 per cent.

Dr. F. W. McCrae, of Atlanta, Ga.—There are just two points in Dr. Bevan's excellent presentation of the subject I wish to discuss, but before doing so I wish to concur in what other gentlemen have said, namely, that this is the most satisfactory presentation of the subject I have ever heard.

The cases that I have seen, where an extensive perineal operation has been done, have eventuated in quite a percentage of painful perineums—pain on standing or sitting. Some of the gentlemen carried about cushions with them. They have no trouble in urinating, but when they stand up for any length of time or sit, they have much pain. An old gentleman in Atlanta, who has suffered very much that way, who has absolutely no bladder symptoms, and who has no trouble in voiding his urine, has pain on standing or sitting.

I have seen rectal complications following this operation.

As to drainage, it is the one thing in Dr. Bevan's paper with which I cannot agree. Proper drainage following these operations, I think, is a great source of comfort. At a meeting of this Association, held in Richmond, Virginia, I read a paper on this subject, reporting a few cases and describing a method of suprapubic drainage, with continuous catheterization. I have used that method a good deal, varying it from time to time until latterly I have been closing the suprapubic bladder wound snugly around a Jacobson catheter, passed through a stout rubber tube, and the bladder is closed down to the size of this tube, and two sutures of silkworm gut are put through the edges of the bladder for tightening the latter; then the irrigations are kept up by an orderly or nurse every few minutes. Hot boracic acid irrigations are used to prevent any clotting, irrigating alternately through the suprapubic opening or retained catheter, and the patients are practically kept dry.

I operated on a patient last Sunday, a week ago, who has never soiled the dressing. It has been a little damp on two occasions, but never sufficiently soiled to be removed. The suprapubic drain is usually removed in forty-eight hours, and the drainage is now going on through the urethra. I do not know whether that man will make a recovery or not.

I speak of the comfort which can be had by a properly adjusted suprapubic drain, as well as continuous catheterization. This is applicable to the first class of cases which Dr. Bevan mentioned, but of course, would not be suitable for the complicated cases.

Dr. Bevan (closing).—I have very little to say, except with regard to one point in connection with drainage. My attention was called to the fact, that in some of the two-step operations which we did, of the much greater comfort of the patient without any attempt at drainage. For instance, in some of the complicated cases where we have made first a suprapubic opening and drained the bladder, and then at a second operation removed the prostate, we found at the second operation that without the introduction of any tube into the bladder or any catheter in the urethra, the patient apparently was much more comfortable. So far as being uncomfortable from the moisture of the dressings is concerned, that is a question of good nursing. A very copious dressing should be applied and changed, if necessary, every two hours to keep the patient fairly dry. I regard a tube in the bladder or a catheter in the urethra, as a source of irritation, and as a possible source of infection. I am rather impressed with the fact that patients have done better since we have been doing away with the drainage early than before, where we made attempts at continuous drainage and irrigation.

I had no desire in my paper to belittle the value of perineal prostatectomy. I have simply felt that from my own experience with the suprapubic method, it gave us fully as good results, so far as the mortality was concerned, or even better results, so far as permanency of cure is concerned, and completeness of cure, without any complications, and I desire to present my views from that standpoint.

DERMOID CYST OF THE KIDNEY.

By William S. Goldsmith, M.D.,
Atlanta, Georgia.

The rare occurrence of dermoid tumors of the kidney is shown by the fact that only two cases have been reported up to this time, one by Paget, in 1853, and the other by Haeckle, in 1902.

The specimen, aside from its surgical importance, must be of unusual pathological interest on account of the curious embryonal development. Clinically, the symptoms were those of a solid tumor of the kidney, probably the malignant type, as it was of slow growth and associated the three cardinal points of malignancy—hematuria, pain, and tumor.

Briefly, the history was as follows:

Male, aged twenty years; family history negative.

At two years of age suffered with pain, directed to the right lumbar region, and at intervals of two or three years was treated for "kidney complaint." When sixteen years old, he experienced the beginning of a dull pain in the right side, which progressively increased until two years ago, when the pressure and pain radius was compared to that of a heavy watch lying in the abdomen. Four years ago attacks of colic, followed by a slight hematuria, developed. These attacks confined him to the house for twenty-four hours, and were relieved by hypodermics of morphine. Recurrences occurred two or three months apart, and for the past two years were characterized by the appearance of a solid tumor, which presented in the right lumbar region.

Hematuria and great pain were always accompanying features, and the disappearance of the outline of the tumor was frequently followed by a cessation of the pain.

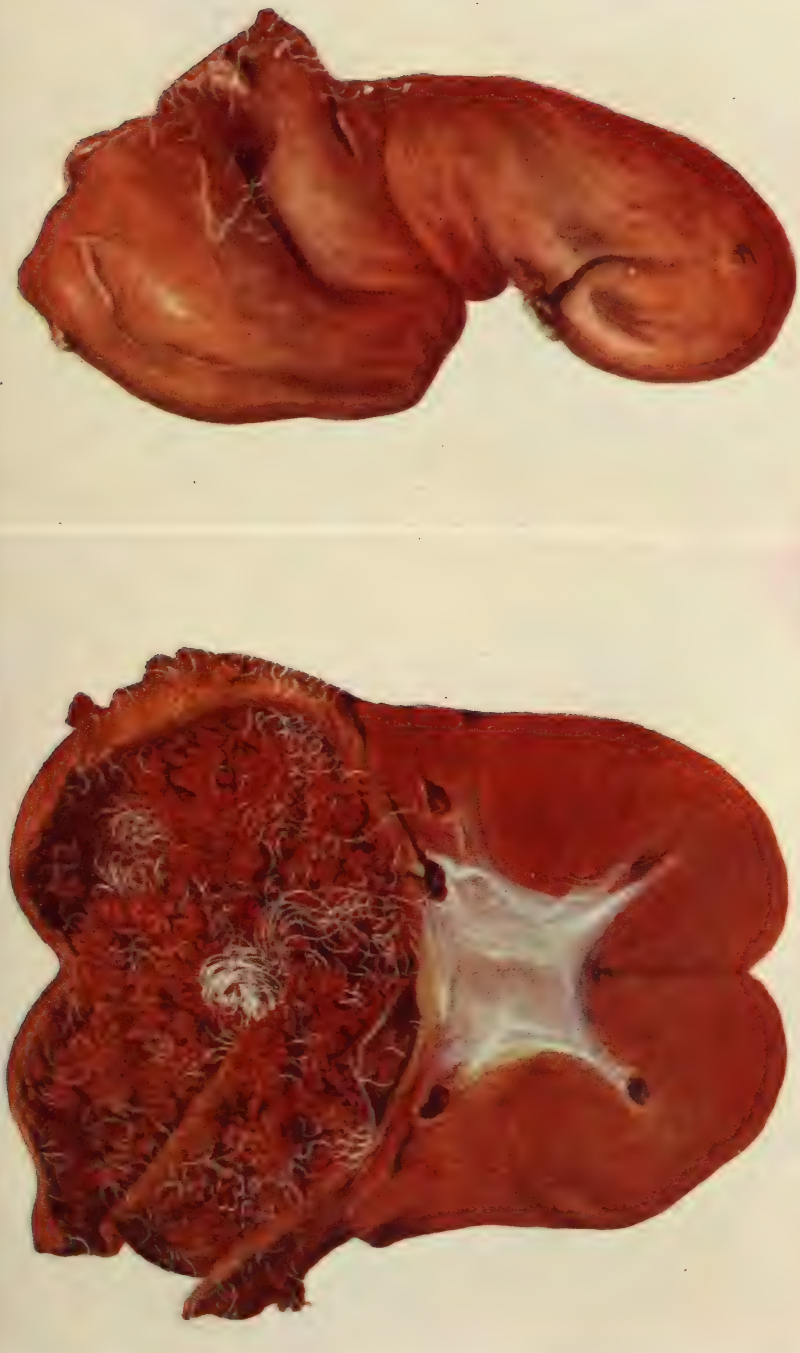
Having witnessed an attack three days before the operation, when the tumor was most manifest, I was convinced that these symptoms were due to a twisted ureter, since the return of the kidney to its normal position practically obliterated the tumor outline. Twenty-four collections of urine showed insignificant deviations from the normal quantity, and microscopic and chemical examinations were negative, except for red blood cells.

The patient's weight was normal and general condition good, and an exploratory operation was advised. The lumbar incision was made, which exposed a large semisolid tumor of the upper pole of the kidney. Efforts to deliver the kidney resulted in a rupture of the tumor, and a quantity of red, granular material was scooped out with the fingers.

Nephrectomy was quickly performed, and recovery was prompt and uneventful. Patient is entirely well. The specimen was submitted to Dr. J. E. Paullin, of the Carnegie Laboratory of Pathology of the Atlanta College of Physicians and Surgeons, who pronounced it to be a dermoid cyst.

Pathological Report.

The specimen consists of a kidney measuring $14\frac{1}{2}$ x 8 x 4 cm. The surface of the kidney is everywhere quite smooth. The capsule strips away easily, leaving a smooth, regular surface. On the upper pole of the kidney there is a mass measuring $7\frac{1}{2}$ x 8 x 5 cm. This mass is covered externally by a thin layer of fibrous tissue resembling very much the capsule of the kidney. The mass itself is larger than that portion of the kidney substance which remains. Definite fluctuation is present. On section a large quantity of dark reddish, thick, mealy material exudes which is more or less matted together by hair. The lining of this cyst is quite irregular, coarse, and



Dermoid Cyst of Kidney

granular, and growing from the inner surface one finds numerous long, whitish hairs. In the cyst contents escaping a tooth is found. This measures 3 x 4 mm.

The cyst wall measures from 1 to 3 mm. in thickness, and has a dark, whitish appearance, being quite tough. No definite mucous membrane can be seen lining this wall on its inner side. In one place it would seem that this cyst communicates with the pelvis of the kidney by a very small opening, which measures 2 mm. in diameter. This, however, cannot be definitely determined, because at this particular place the kidney has been sectioned.

The cut surface of the kidney shows the cortex to measure about 4 mm. in thickness. The Malpighian bodies stand out quite distinctly. The pyramids appear apparently normal. The pelvis of the kidney shows a slight thickening, and in places there is a definite fibrinuos exudate covering the mucosa. In places there are small hemorrhages beneath the mucosa.

For microscopic examination sections were taken from the kidney substance—the wall of the cyst, pelvis of the kidney, and a portion of the contents of the cyst.

Sections of the kidney show the capsule to be about normal in thickness, and there is no perceptible increase in connective tissue lying between the capsule and the parenchyma of the organ. The Malpighian bodies are about normal in size and shape; the tuft, however, contains quite a number of red blood cells, and in places outside of the tuft between this and Bowman's capsule there is a finely granular hyaline material taking the eosin stain. The cells lining the convoluted tubules, as a rule, are swollen and fill the lumen. Many of the uriniferous and collecting tubules are dilated, and contain finely granular coagulated material. There is no marked infiltration of the tissue between the tubules with either connective tissue or small round cells. The bloodvessels contain quite a few red blood cells, but there is apparently no extravasation of the cells into the surrounding tissue.

Section of the cyst wall shows that it is composed of a well-defined connective tissue. Growing from its surface one observes numerous hairs; and in one portion of the section squamous epithelial lining is evident. The wall is everywhere infiltrated with numerous small round cells.

Section of the cyst content shows that it is made up of a material which in places has the structure of myxomatous tissue. The cells forming this granular tissue are columnar cells with the nuclei placed toward the base of the cell with an even-staining protoplasm. In other places one finds a tissue which resembles very much the collecting tubules seen in the normal kidney. There are quite a few red blood cells scattered among these glandular structures. Numbers of small round cells are everywhere infiltrating the structure. Certain portions of it are composed altogether of a pink staining, finely granular material showing no nuclei. Occasionally one sees cross and longitudinal sections of hairs scattered about through this mass.

The pelvis of the kidney shows everywhere very marked small round-cell infiltration, with here and there over the surface of the mucosa a small amount of fibrinous material, in the meshes of which there are a few red blood cells. There is apparently no destruction of the epithelial lying beneath this exudate.

Diagnosis: Dermoid cyst of the kidney. Parenchymatous nephritis (slight). Catarrhal pyelitis (slight).

SURGERY OF KIDNEY STONE.

By Maurice H. Richardson, M.D.,
Boston, Massachusetts.

In the course of my daily work, especially in private practice, I have been impressed, particularly of late, by the frequency of serious disaster of the kidney due to stone. When I recall how important a part in surgery the treatment of stone in the bladder was in the '70's, I am impressed more deeply than ever by the importance of stone in the kidney. The ordinary stone, excluding the phosphatic deposits of chronic cystitis, affected, as a rule, only the bladder. It was comparatively infrequent; and when operation, through aseptic methods, became safe, cutting, either through the perineum or above the pubes, became safe.

Stone in the kidney is a very different matter. The situation—in the heart of a vital organ, and that organ itself in, so to speak, the heart of the body—makes surgery of the kidney of the highest importance. As compared with stone in the bladder, its occurrence seems extremely frequent.

It is not for the abdominal surgeon to say how frequent renal stone is in general, when his opinion is based only upon the frequency of its occurrence in his practice. He can say, as I do, that it is a common occurrence in abdominal surgery to meet with cases in which stone in the kidney is at least suspected; and if, in his total of abdominal operations, 5 to 10 per cent. are for kidney or ureteral stone, it is undoubtedly true that that percentage is due to his particular line of practice or experience or reputation. Be that as it may, cases

of renal stone are coming to me now in such numbers that I cannot but be impressed by their frequency.

In bringing up this subject I am influenced chiefly by the fact that many stones in one kidney or both are overlooked through error in diagnosis; and that slowly perhaps, but surely, changes which in a few years may prove destructive to kidney, health, or even life itself, may take place.

At a recent autopsy I saw healed tuberculosis of the right kidney. The records contained nothing that would suggest in the history, early or late, the presence of a renal tuberculosis. The pathologist, in answer to my query, said, "Oh, yes; healed renal tuberculosis is more common that you surgeons appreciate"—a fact very interesting to me. But, so far as I know, this particular healed tuberculosis was not used at all to find out just what clinical evidence there had been of a tuberculosis which eventually healed. The patient could not be questioned, and no one took any special interest in the case except myself.

In spite of all the observations at the autopsy room and at the operating table, I feel that our knowledge of renal stone is very incomplete and inadequate from the point of view of prognosis.

And prognosis, as I have said repeatedly in connection with disease, both medical and surgical, is the thing about which we know least where we ought to know most. Take a case of acute appendicitis—have we not demonstrated beyond dispute that the prognosis cannot be accurately told in any case, and has not the medical and surgical world become convinced, therefore, that the only safe course is earliest possible operation? And in gallstone disease, is not an accurate prognosis the most important fact of all, for accuracy in prognosis depends upon accuracy in diagnosis, and especially upon accuracy in deducing from symptoms the real pathological lesion?

Furthermore, in appendicitis, gallstones, and in all diseases demanding surgical operation, does not prognosis depend

upon such things as the operator's skill and experience, the environment of the patient, his powers of resistance, peculiarity of lesion, and complications in other organs? I am convinced that all these questions should be answered affirmatively.

Indeed, it is safe to say that prognosis is practically impossible of accurate formulation for one reason, if for no other—that no two cases are exactly alike. No two cases of gallstones were ever exactly alike, considering all the anatomical areas involved. Taking together the chief organs of life—thoracic and abdominal—the number of combinations which they permit, of disease and of health, is really infinite. So I repeat, in establishing the prognosis, say of gallstone disease, accuracy is impossible. One may say that the combined experience of many observers shows that the prognosis is, on the whole, good, but no man can predict that in the given case the prognosis is surely good, for that case may be the very one in which the combination is bad, and in which the fatal result is going to take place.

In the surgery of kidney stone our experience, as compared with gallstones, is small. But is the number so very small? How do we know that renal stone is not much more frequent than we have been led to expect? We do not know, except by the findings of large numbers of autopsies, as we do in estimating the frequency of gallstones. But I believe the number to be much greater than we realize, as my own recent experiences tend to prove. Renal stone often exists without our suspecting it. To illustrate, for example, the presence of unsuspected renal stone, which caused sudden and unexpected death, here is the case of Mr. K., upon whom I operated for stone in the bladder way back in the '80's. This man died of suppression of urine in 1907—suppression of urine dependent upon stone in the kidney! Three renal calculi were discovered at the autopsy, and no one suspected in the least their presence. Had no autopsy been performed, death would probably have been attributed to acute Bright's disease.

Is stone an incident in the course of renal disease? Whatever the facts may prove to be, it seems to me highly probable that renal stone is an incident in the course of anomalies of renal secretion.

Once a tendency, always a tendency, is true in many human things. Once a tendency to tuberculosis, always such a tendency. Once a tendency to gallstones, always a tendency, I was going to say, but here we surely have a brilliant exception; for if clinical evidence has convinced me fully of one truth, that truth is that the thorough and complete removal of gallstones is permanently curative, for the operation not only removes from their nidus the gallstones themselves, but it frees that area from the local causes of gallstones—microorganisms. Is this likely to be so in the case of renal stone? To apply the same reasoning that we apply to gallstones, we must assume, first, that renal stones form upon bacteria; secondly, that the operation removes them all; thirdly, that, with the stones, all bacterial elements are thoroughly and forever removed.

But it has always seemed to me in gall-bladder surgery that there are bacterial elements unavoidably remaining in the gall-bladder and in the ducts. When the surgeon's incision into the biliary tract is closed so as completely to prevent the passage of fluids—whether bile or pus—these fluids must remain in the biliary tract, whence they can be thoroughly removed only by the biliary stream. Now, it is against reason that the final closure of the wound, say in the gall-bladder, leaves on the gall-bladder side of the sinus a perfectly normal, healed surface without microörganisms of any kind, especially after operations upon infected gall-bladders. And so in renal surgery, it is beyond belief that the moment the wound ceases to discharge urine—when a kidney is cut open or resected—no microscopic particles remain in the urinary tract to become the nucleus for future deposits.

Such a conviction, even if without sound foundation in

fact, seems to me worthy of consideration as explaining the re-formation of calculi in the affected ureter or in the bladder; but it does not explain their formation in the unaffected kidney.

We must, I think, come to the theory that I have already mentioned, namely, that renal stones are "an incident in the course of anomalies of renal secretion"—the result of a tendency of the urine toward the formation of crystalline aggregations while it is yet in the urinary passages.

The formation of urinary stones upon microörganisms is a very attractive theory, and one that should be capable of easy demonstration.

The first fact to be considered is that stone may exist in the kidney without arousing any suspicion on the part of the patient. In this respect renal stone is very much like biliary. It is doubtless true that renal stone, like other stones, causes little if any trouble until it either gets impacted, and thus excites duct spasm, or until its rough surface causes an ulceration with infection. I do not refer at this time to those calculi which are deposited in infected urines, but rather to the stones which crystallize from an excess of uric acid or oxalate of lime. There are no symptoms in the patient's feelings calling attention to the kidney, either in his comfort or want of it, or in the urine as he is used to observing it as normal—no pain or discomfort, no blood or pus.

The renal stone may exist, as I say, without being suspected; it may be contained in the kidney without being perceived even when the kidney is actually in the surgeon's hands. I have examined several thousand kidneys with my hand in the abdomen. I have detected what seemed to me distinct abnormalities; but I have never, except when the diagnosis had been made or suspected, felt a stone in the kidney in the course of my usual routine examination of the abdominal viscera. A stone may therefore exist in the kidney, not only without arousing any suspicion on the part of the patient, but without being detected by the surgeon with the kidney actually in his hands.

In a recent case I found a stone in the left ureter only because the *x*-ray in the hands of a skilful man, Dr. Percy Brown—with certain significant symptoms—suggested the possibility of a stone there. I even gave up the search, and attributed the symptoms to an abnormal appendix, until I happened to strike upon the calculus by renewed search and by exposing the ureter.

In exploring the biliary tract with the fingers in the course of abdominal operations I find calculi very frequently in the gall-bladder and cystic duct. Sometimes I have found one or more in the common duct, and that, too, with no history of biliary colic or other discomfort.

But, as I say, such a discovery in the genito-urinary tract, especially in the kidney or ureter, is in my experience most unusual. Even when there is a strong suspicion of stone, the surgeon is only too likely to be unable to feel that stone.

It would seem, from these facts, that stone in the kidney or ureter is very infrequent, but such a deduction is not warranted. Judging from the number of cases in which the question of renal stone arises, the number is by no means inconsiderable.

Upon the cadaver it is difficult to detect differences in the health of kidneys by the sense of touch alone. Indeed, I do not know that the pathologist ever makes such observations. The surgeon must depend for his diagnosis wholly upon the sense of touch.

Palpation of the abdominal viscera at the autopsy table, through an incision admitting only the hand, is an extremely useful means of teaching important facts of palpable disease. In many diseases and in many organs the evidence is about as good upon the cadaver as upon the living body; but the solidification of the paranephric fat interferes seriously with palpation of the kidney. I am not sure that the cold kidney is not very different from the warm one. In autopsies made shortly after death the changes dependent upon cold would

not interfere with a palpation closely resembling that during life.

The surgeon who operates within the abdomen will quickly see the need of recognizing, beyond mistake, states of health and disease in the abdominal viscera. However much he may be disinclined to believe what I am here saying, let him be confronted by a tumor of the right kidney and a doubtful efficiency of the left, and he will be forced to admit the importance, not to say the indispensability, of being able to recognize with the finger tips not only the nature of the right kidney tumor—whether demanding nephrectomy or nephrotomy—but the efficiency of the left kidney—whether it is able to carry on an adequate elimination of urine in case of nephrectomy of the right.

Such a question may arise any day, and the surgeon will not always be able to rely upon ureteral catheterization; indeed, he should never rely absolutely upon it.

Take a recent illustrative case. The diagnosis before exploration is not absolutely positive, though it favors renal stone. The symptoms have been pain in the region of the right kidney, and there has been some evidence of renal irritation, as shown by the examination of the urine. The *x*-rays have not been positive.

The surgeon exposes the right kidney, but is unable, by palpating it, to feel a stone. He next separates the kidney from its attachments, so that he can get it in his hand—fingers on one side and thumb on the other. He can compress the renal pelvis between thumb and fingers in such a way that he could detect a pin head. He feels nothing abnormal either in the pelvis or in the upper portion of the ureter. He then palpates the renal parenchyma, and feels nothing wrong there.

He can be sure that no stone is present in the ureter or renal pelvis, but can he be sure there is none in the depths of the kidney tissue? He certainly cannot. To make as sure as possible, he delivers the kidney as far as practicable,

so that he can take it in both hands. He palpates in every direction, and still feels nothing. Is he still absolutely sure? By no means. What next?

If one portion of the kidney seems thicker than another, he may probe this area with a fine, sharp needle. He encounters nothing. What next? Nothing remains but to cut directly into the renal pelvis, unless the surgeon is to abandon the operation as a fruitless exploration. Suppose he cuts into the pelvis through the parenchyma? He subjects his patient to a bloody, formidable, and but too often useless procedure.

I have been in this position a few times and have seen others in it. I have been fortunate in not losing patients after so severe an operation, but I have seen a strong young fellow die miserably as the result of it at the hands of a skilful operator; and my next case may prove as unsuccessful.

But what is the surgeon to do under such circumstances, when the proper course to follow depends entirely upon the reading of his fingers tips? Except for the interpretation of brain conditions by the sense of touch, I know of no anatomical changes so hard to recognize by the sense of touch as those of the kidney; and cerebral conditions which for recognition depend upon such gross observations as those of the exploring finger are indeed discouraging, and should hardly be mentioned in comparison with diseases of an organ like the kidney.

In many, probably in most, renal cases the surgeon will be able to tell just what he feels. Take, for example, a lobulated kidney, three or four times as large as normal, bulging with fluid, in which large stones can be felt. Such a kidney is the seat of pyonephrosis, dependent upon stones or causing stones. But may it not be some other fluid? My last case felt like an abscess of the kidney with stone. It proved to be stone in a bloody cyst. In this very case the question of extirpating the kidney—it was the right—depended upon the diagnosis—whether tuberculosis, simple abscess, hemorrhage, or neoplasm, and especially upon the condition of the left

kidney, which seemed to me small and hard. I do not care what the catheterization might have shown in this case, it would never in the world have given such valuable evidence as I got through a median incision with palpation of each kidney—an examination in which every assistant took part. We were able to say that there was something in the right kidney that demanded exploration, and that the condition of the left made extirpation of that right kidney inadmissible unless absolutely unavoidable. (*Office Records*, vol. lxxviii, p. 79.)

I exposed the kidney through my muscle-splitting method, delivered it, aspirated it, and finally resected it, saving three-quarters of its bulk in perfectly healthy renal tissue. And the patient made a good recovery.

The exploration of the kidneys by the hand is, in my judgment, indispensable in renal surgery. A median incision which makes such an investigation possible is, I believe, fraught with as little danger as ureteral catheterization, especially in the male, and adds information of the utmost value which can be obtained in no other way.

In most cases the diagnosis is positive enough to require but one cut—that over the affected kidney—so that the median incision is unnecessary. When the kidney affected is doubtful, I take the median line first, and the second cut, if any, may then be made intelligently.

The first thing, then, the most important that the surgeon can bring to the operating-table in kidney cases, is a good working knowledge of the anatomical conditions of the living kidney, as interpreted, first, by the sense of touch; and secondly by the sense of touch and sight.

The kidney is a difficult organ to get a clear idea of by the sense of touch alone; yet one can detect any marked changes in size, situation, and consistency. To detect a stone in the kidney is, as I say, a measure of great difficulty and uncertainty.

A curious condition I have lately found in which there

seems to be an enlargement of the renal pelvis on both sides. I was not sure that there was a hydronephrosis, and yet the pelvis was certainly much larger, broader, and longer than normal. The finger tips could be pressed into the region of the calices, and the renal parenchyma seemed less bulky than usual. There were no pathological changes in the urine, and there were no symptoms. I noted these variations from the usual with considerable interest.

In pathological cases the interpretation of enlargements is difficult. One finds in pyonephrosis sometimes an enormously enlarged kidney with sacculations containing pus. The whole kidney is a bag of fluid of irregular outline; a sacculated, purulent organ, in the contents of which one sometimes can detect, with the fingers, calcareous masses. Palpation of the ureter emerging from a diseased kidney is impracticable when the ureter is in health. A ureter perceptible to the fingers is an unhealthy ureter, and is usually tuberculous.

It is not my intention at this time, however, to go into details of abnormal anatomical appearances as demonstrated upon the living, except as it elucidates the subject of renal stone.

There are two pathological variations in which palpation is of the utmost importance—the renal stone with trivial change in the renal anatomy and physiology, and the renal stone with complete kidney destruction, whatever the bacterial elements which have accomplished that destruction.

In many cases the secreting power of the kidneys will have been determined with more or less accuracy by means of ureteral catheterization, and yet I have never learned to look upon this manner of investigation with absolute confidence, nor as a means without considerable danger.

The urine examination will doubtless have settled the question of renal tuberculosis, so that the surgeon will have much information about the kidney when he first reaches it with his fingers. Relying on the fingers alone, no examiner

will be able to express a positive opinion as to the exact nature of the process of renal destruction, though he will get a very good idea of its extent. He will be able, in suspected stone, to tell when he really *does* feel the stone, but he will not be so certain when he does *not* feel it. It is much easier to rely upon a positive feel that there is a stone than a positive feel that there is not. When a surgeon once gets the sensation of renal stone through the renal pelvis or parenchyma, he knows it just as positively as he knows when he gets the feel of a gallstone. When he thinks he may be feeling one, but is not sure, he becomes absolutely uncertain as to the reliability of the finger tips.

Hence the grave uncertainty with which the surgeon cannot but be depressed when the history, clinical symptoms, and *x*-rays all point to a stone which he cannot be sure he feels, and to demonstrate the presence or absence of which requires a bloody dissection of much danger.

This investigation of the comparatively normal kidney containing a possible stone is a matter of the first magnitude in renal surgery. The operator must, by thousands of observations, accustom himself to the feel of the normal kidney in life. There is no other way of educating the touch, and he who practises this touch the most faithfully and frequently will be the one to interpret most accurately and fearlessly the reading of his finger tips.

I am surprised every day that so little attention is paid by operators to the education of the touch in this regard. We all know perfectly well that the guide to the lesion and the indications for operative measures are what the fingers feel, aided occasionally by other means. All regions not easily accessible to the eye must be studied with the fingers. It is safe to say that very few abdominal tumors are diagnosticated by the sense of sight. Even if they are large and visible, as ovarian cysts are, the diagnosis that really influences the operator is that of parts which cannot be seen. Three cases within a week have shown this: Mrs. W. (vol. lxxix,

p. 49), with a large benign tumor presenting, had cancer of the pelvic portion; Mrs. H., with a multilocular ovarian cyst, had cancer infiltrating the depths of the pelvis, invisible and inaccessible without removal of the bulk of the tumor; and Mrs. M. (vol. lxxviii, p. 153), with a forty-pound multilocular cyst which had unknown possibilities of malignancy until after thorough extirpation.

Renal surgery is an important part of abdominal surgery, and the surgeon whose experience is large is best educated to perform it—not in the narrow specialty of genito-urinary surgery, but through the broad experience, first, of general surgery, and later of abdominal surgery.

In no other way can the surgeon take that broad view of renal lesions and their appropriate treatment. General surgery, with wide experience in medical diagnosis, will best give, I am convinced, that broad grasp of any special abdominal disease which will enable the surgeon to apply a wise course of treatment, whether conservative or radical.

And renal surgery—as Fenger said—should be whenever possible radically conservative. Risks are justifiable to save the precious secreting tissues of the kidney when risks are not justifiable to destroy it.

When the surgeon examines with his fingers kidneys which show unmistakable changes in shape, size, and consistency, he must determine what the lesion is, what it means to the patient, and what it demands in order that the patient's health may be, with the least risk, permanently restored. When there is little deviation from the normal found, he will have had perhaps evidence more or less reliable from chemistry, bacteriology, *x*-rays, and ureteral segregation.

I admit my personal feeling of responsibility when confronted by the problem of anatomical diagnosis on the living patient, with kidney fully exposed to manual palpation.

What, in advanced cases of renal stone, does the surgeon feel; what evidence indicates nephrotomy; what nephrectomy; what no operation?

This question expresses the gist of the whole matter. Would that it could be answered as easily as it is asked.

The surgeon must not only ascertain accurately with his fingers the extent and nature of the pathological condition, but he must, upon that demonstration, base an accurate prognosis of the future of that kidney under efforts to conserve what of it is good, as well as the prognosis of the patient under the proposed local operation. And furthermore (as I say elsewhere), he must lay down the prognosis as influenced by his examination of the other kidney, plus the probable effect of the proposed operation.

The advanced changes by which the kidney is practically destroyed, or by which enough of valuable tissue is left to make conservatism worth while, cannot always be told with accuracy, even with the kidney in the hands. I regard a sacculated kidney as practically worthless; a kidney with a single sac, though it occupies a third or a half of the kidney body, as worth trying to save, if there is reason to think that the pelvis and ureter are free, as determined by ureteral investigation. Yet it will not do to assume, if such a kidney is giving no urine through the catheter or the ureter, that it is incapable of valuable work and more or less restoration of function, for the ureter, even if blocked, may by drainage become patent.

The trend of thought and study should be toward conservatism. In trying to explain the loss of renal function, we should make every effort to find an explanation which by conservative operation will permit restoration of that function.

The one thing to remember in palpating the kidney just prior to operating—especially before doing a destructive operation—is that there is every reason for trying to save the kidney; that the burden of proof is on him who would destroy rather than on him who would conserve so valuable an organ.

Some ten years ago I removed a tumor of the left kidney, after thorough palpation of the right. There was what seemed to me a sarcoma of the left kidney. The right kidney

was not exactly normal to the touch, yet it was not especially abnormal. I removed the left kidney, which proved to be a a shell of renal tissue—good for work, what there was of it—about a hydronephrosis. The patient died with anuria. Autopsy showed the right kidney to be also a shell, but smaller. It was a case of double hydronephrosis not recognized by the touch. The operation was strongly contraindicated, and was, in fact, fatal because it destroyed just that amount of renal tissue which enabled the patient to live. With both kidneys partly disabled, life was possible; with one kidney removed, life was impossible. Kidney catheterization in skilful hands would, I think, have saved the patient from the error of judgment. This was, however, before the day of ureteral catheterization.

Catheterization of the ureters is a highly specialized procedure, especially in the male; and its value to the surgeon may in a general way be gauged, I think, by the practical use to which one in active surgical practice puts it.

I have observed the methods and the results of cystoscopy and of instrumentation of the ureters in the hands of men who have made special study of the subject, and whose skill is great. My opinion is that this method of investigating the kidney is useful only in the hands of highly trained men who have devoted an enormous amount of time to the practice of its technique, to the recording of their observations, and to the verification of these observations by operations which give abundant opportunity for visual and manual examinations and control.

I cannot but regard even so comparatively simple a measure as cystoscopy, except in the hands of the most highly trained expert, as one which is not only valueless but actually misleading. Even in the hands of such men, instrumentation of the ureter I believe to be an operation of danger. I do not accept efforts of the very best without reservation; and in every case, no matter what the expert report, I feel constrained to verify with my own hands and eyes the findings

of ureteral investigation through the bladder. Right or wrong, through abundant experience with my younger colleagues, who make these examinations with extraordinary skill, I would never remove a kidney without actually feeling of the other one for information which is indispensable, and which can be got in no other way. If, then, I have been brought by abundant experience to this conclusion, and if this conclusion is a sound one, what are we to do about ureteral catheterization and cystoscopy in renal surgery?

Cystoscopy will, with very slight risk, show what is coming from an affected kidney—pus, blood, or nothing at all abnormal; catheterization will tend to show the condition of each kidney; —with the results of manual examination, it may be of great value. A kidney, for example, which the catheterization shows to he healthy will be proved healthy by the actual feel of it; a kidney which is pronounced normal may be all right and it may not. If the manual examination confirms the instrumental, all is well; if it does not confirm it, let the surgeon be on his guard.

In tubercular cases I would forbid ureteral catheterization under all circumstances.

In considering the symptoms of renal stone, we have, first, the clinical picture of renal colic in which the pain is excruciating—an agony unbearable—the patient writhing in torture, with reflex signs in the expression of the face, the cold perspiration, the cold extremities, the accelerated pulse. In the male there is in many cases retraction of the testicle on the affected side, with pain shooting down into it. Locally there is tenderness, and a soreness that persists some days after the successful passage of the stone to the bladder. I have seen, in addition to these local and classic signs, distention of the abdomen, which, with tympany and vomiting, has suggested a peritonitis. One must, indeed, look out for a renal cause in some forms of suspected acute general peritonitis.

The urine often contains blood enough to make its presence conspicuous to the eye; if not, the microscope will show

red corpuscles and other signs of renal and ureteral irritation. Altogether the picture is clear and unmistakable.

In the present paper I am considering, however, not so much the typical case as those comparatively rare ones in which strongly suggestive histories and signs are wanting. I am considering rather those cases which are diagnosticated after a prolonged study suggested only by a suspicion; for many a stone will be found, once the symptoms suggest it—no matter how slightly. Just as the bulk of gallstone surgery comes today from histories which even ten years ago would have excited no great comment, so today, as I fully believe, the early and brilliant surgery of renal stone is going to depend upon lines of investigation suggested by very indefinite symptoms.

To show you the truth of this prediction, I have only to bring forward cases of renal and ureteral stone treated by appendectomy; cases of renal stone treated for gallstones, for gastric symptoms, for neuralgias, indigestions, intestinal colics. I may be widely prejudiced by the numbers of cases that really have drifted into my office, but when two or three patients have come in a single afternoon, I cannot but wonder whether renal stone is not really a much more frequent disease than we have usually thought.

Renal stone, like gallstones, speaks first to the patient and in a way which may drive him to the physician, or may excite only a shrug of the shoulders and a call for a plaster or some medicine for rheumatism. The first and most important call upon the patient's attention is some attribute of that broad word *pain.*

The pain of renal stone I cannot as yet speak of with that confidence which a vastly larger experience in the diagnosis of gallstones has given me. Nevertheless, I can in a hundred cases, more or less, give you some idea of my meaning when I say that stone in the kidney makes known its presence sooner or later by symptoms of irritation described by some expression meaning pain. That expression may be a transi-

tory and trivial discomfort, or it may be an unbearable agony; it may be a heavy, solid, unending pain; it may be a nauseating distress. It may increase slowly or quickly to its acme; and it may subside in the same fashion. The acute, excruciating pain of a stone engaged in the ureter may likewise begin instantly and without warning and persist in paroxysms of indescribable severity. The engaged stone not successfully pushed along by ureteral spasm will halt where it becomes first impacted, and the painful and unsuccessful spasm will give way to a dull, deadly grind, which in turn will slowly disappear, with the occasional recurrence of subsiding duct spasm. When the stone is fastened irremediably in its ureteral nidus, its presence will be made manifest by pains of varying character and severity.

Stones in the kidney, according to shape, size, situation, roughness and the like, will in theory at least be responsible for symptoms only when they cause irritation with or without muscular spasm, with or without infection of the urinary tract. I am not considering at present stones which are formed as the result of infected urine, but stones which are sometimes the cause of infected urine. What these symptoms are can be determined only when we know surely that stones are present. We know, of course, that that one great sign is pain of some sort; but what kind of pain to expect with certain shapes, sizes, and situations of stones, we do not know; nor can we tell by the kind, situation, extent, persistence onset, cessation, or other attributes of the pain just what the shape, size, situation, and other attributes of the stone may be.

The signs of irritation, then, are subjective feelings of discomfort, from the most acute and uncontrollable pain to a hardly noticeable malaise.

Constitutional signs may or may not be present. It is safe to say that fever has a grave significance in renal stone, for it means changes of far-reaching importance in the renal pelvis. Fever not only confirms the presence of suspected stone, but it adds the greatest possible weight to the indica-

tions for treatment. I was inclined to wait and study out my lesion in a case of renal stone (vol. lxxviii, p. 75) until I found that there was a daily temperature of 102° to 103°. The diagnosis was confirmed by the *x*-rays, but I wished to follow the clinical course for a week or two. There was so much fever that I deemed this course unwise, and advised immediate operation. The patient declined to follow my advice, as he had declined to follow Dr. Jones'. The subsequent history showed spontaneous recovery.

This patient had a severe attack of pain, with rapid pulse and temperature of 102°. He was in bed about twenty-four hours. He has been well ever since he recovered from this attack, which was probably ended by the passing on of the stone.

That there may be a transitory fever which does not have a grave significance, I have no doubt; but the irritation of stones in the renal pelvis means, sooner or later, a destructive pyelitis.

The symptoms of the greatest importance are those found in the urine. The commonest of all is blood, either enough to give a distinct bloody tinge or to fill the slide with red corpuscles. With blood there will be found pus corpuscles, and such crystals as, on the chances, compose the stone—uric acid, oxalate of lime, and the like.

Long before the *x*-ray examination is made, the surgeon's attention will have been attracted to the kidney as the source of renal pain. The *x*-ray will show a stone, surely or doubtfully, if one is present that casts a shadow.

The physical examination in suspected stone will seldom reveal any sign of importance, unless changes have taken place in the kidney which increase greatly its size.

Once the attention has been drawn to the kidney as the source of symptoms, the diagnosis of stone is easy, provided the stone can be shadowed by the *x*-ray. When for any reason, but chiefly from a composition which throws no *x*-ray shadow, this means of demonstration fails, the diagnosis is

not always easy. I have made many correct diagnoses with the aid of the *x*-rays, some in spite of it, and a few against its evidence. It is well, therefore, first to consider the diagnosis of renal stone as if the *x*-rays were unknown.

We must weigh first and most carefully the evidence of pain. While it is true that a stone may exist with little if any pain, yet in the absence of pain no stone would ever be suspected by the patient or by the physician, unless something decidedly abnormal were discovered in the urine. Hematuria would surely attract the patient's attention and bring him to the physician. Any unusual deposit, color, or consistency might start the train of investigation. Whatever the source of the patient's anxiety, the physician, seeking for a cause of urinary changes, would last of all suspect stone were pain absent.

The significance of pain in general affecting the kidney or the ureter, and later perhaps the bladder, lies in its character, its mode of onset, its extent and breadth, its way of stopping, the means necessary to overcome it, its effect upon the patient. The weight to be given pain depends upon the accuracy with which it is observed, the manner in which it is described, and upon the patient's powers of bearing it. Any discomfort persisting in close proximity to a kidney should excite a suspicion of renal stone, especially in the left abdomen, where there is neither appendix nor gall-bladder to confuse.

The only pain which will be characteristic enough to indicate a positive diagnosis will be the awful spasm of renal colic. The less like renal colic the pain, the less significant of stone that pain.

Tenderness is a symptom which confirms the localization of pain. Pain always in the same spot, and tenderness always in the same spot, are two very telling symptoms. Here again is a close analogy between the gallstone and the renal stone. Tenderness along the course of a ureter is the rule after the passage of a calculus; and when the stone is impacted, the tenderness is at once localized over the spot and remains there.

Tenderness is present in all the later organic changes in the kidney due to stone.

The significance of tumor is of the first importance, for with a diagnosis between gall-bladder, kidney, and appendix the discrimination will be positive, and usually easy by palpation of the tumor alone. Indeed, so easy is the differentiation that I do not intend to spend much time in considering so plain a subject. Pain, tenderness, perceptible gall-bladder mean gallstones. Pain, tenderness, tumor of the kidney mean kidney stone; the same, with a tumor in the appendix region, means appendicitis.

But does it always mean this? It does not, and it is here where skill in diagnosis, based upon experience, comes in. It is not always possible to tell the difference between a gall-bladder and a kidney, though the problem is usually easy. Nor is it easy always to tell that a tumor in the right iliac fossa is appendix, for it may be an impacted ureteral stone. Nor can you, in acute pain and tenderness, with an apparent gall-bladder enlargement, be always positive that it is not a high appendix. I have seen several errors of this kind, and I urge extreme care in studying the case from all sides, and not being content with a diagnosis based, as I have based it thus far, on pain, tenderness, and tumor, without considering other signs.

A diagnosis is, however, strongly indicated by pain, tenderness, a tender and enlarged kidney. Is it strong enough to base a sure indication for operation? It certainly is not, without study of the urine, which under careful examination ought to confirm or deny the opinion of offending renal stone. I regard bloody urine as pathognomonic of renal or ureteral stone, when there has been pain, with or without tenderness in the kidney or along the ureter. If there are only a few red blood corpuscles in the field, I regard the fact as one of great significance. Pus with blood indicates renal irritation but of longer duration, though the pus may come from some part of the urinary tract unaffected by the stone.

In cases of advanced renal destruction, there will be only the abundant pus of pyonephrosis, the diagnosis of which—whether calcareous, tubercular, or of other nature—exceeds the scope of this communication. Suffice it to say that the observer will be on the right track when he finds abundant pus with an enlarged kidney, to apply the final and most important test of all—the *x*-rays. The diagnostic value of the *x*-rays cannot be exaggerated in the great majority of cases. When the *x*-rays are in the hands of skilful and experienced Röntgenologists, a positive opinion that stone is present outweighs any amount of negative evidence.

I have not always felt in this way, for in the beginning I was willing to take the chances against the diagnosis, even with positive *x*-rays. And I was successful so many times that I began to feel a certain contempt for an *x*-ray diagnosis. I have been convinced in the past year that the *x*-rays in the hands of the expert are always *just what he says they are.* And when he is positive, I feel positive enough to explore a kidney in which I feel nothing. When the *x*-rays are negative, however, and my own diagnosis positive, I am inclined to explore in spite of the findings of the *x*-rays, especially in view of the fact that stones of certain composition throw no shadow.

Other things besides the shadowless stone seem to make the *x*-rays unreliable—the thickness of the abdominal wall, the condition of the bowels, and the like. My own guide to the interpretation of renal symptoms, when the *x*-rays are doubtful, are the pain, tenderness, and urinary signs. When there are signs in the kidney, the diagnosis is all the more positive. And when my diagnosis is so positive as to conflict seriously with the evidence of the *x*-rays, there is pretty sure to be a renal stone which does not throw a shadow.

In a word, then, the diagnosis of renal stone rests upon expressions of pain. Pain suggests stone; tenderness makes the suggestion stronger; blood in the urine strengthens the diagnosis enormously; an objective sign like a tumor makes the diagnosis still more sure, though it adds the element of

neoplasm, which may obscure the diagnosis or throw it out entirely. Finally, the *x*-rays prove the presence of stone by positive evidence, though they cannot disprove it by negative. Ureteral catheterization I should never employ for diagnosis.

The *indications for treatment* in suspected renal stone are, I think, quite clear in the ordinary unilateral case. Indications are based upon the prognosis of renal stone left to itself, and the prognosis of operation for its removal. As I have already said, the future of a kidney containing a stone in its parenchyma, its pelvis, or its ureter, is distinctly serious. No renal stone was ever yet dissolved by medical treatment. Once a stone has begun to crystallize, it is only a question of time when the affected kidney will be totally destroyed; and that destruction, usually slow, will be attended by suffering and disability to the end.

The prognosis of operation for removal is in the beginning good; the earlier the operation, the greater the safety, with this exception, that nephrotomy through young and healthy renal parenchyma is more bloody than that through the shell of a pyonephrosis. Moreover, the other kidney has slowly assumed the duties of double excretion. But the prognosis for cure with a good resulting kidney is infinitely better with the early operation.

Operation is therefore indicated in a hopelessly impacted stone—one too large to pass into the bladder and out through the urethra. The indications are modified by the condition of the other kidney. The question of operating upon a single kidney demands a special consideration beyond the scope of this paper.

Operation is contra-indicated on general principles when there are other serious lesions of heart, lungs, or the kidneys themselves. Then "half a loaf is better than no bread"—a livable life is better than no life.

As to surgical treatment, I do not intend to go into operative technique in detail. I have long practised a method of my own—I do not know that it is original—of approaching

the kidney through a muscle-splitting incision in the flank. I am able to separate, and deliver into easy manipulation, the ordinary kidney. I palpate with extreme care, and, if necessary, incise the renal pelvis through the parenchyma. Best of all, I cut directly through the pelvis itself, at its lower edge usually, and explore with eye, finger, and instrument the pelvis, calices, and ureter. This cut I close effectively with fine sutures, and the bloodless operation is finished. When pelvic incision is impracticable, I go through the kidney tissue, but I find it fearfully bloody. I close the opening with catgut or leave a drain; or pack with gauze.

The results are overwhelmingly good as to immediate prognosis.

In the treatment of kidneys containing one or more stones the chief question to consider is whether to remove the stone by simple incision, or to resect the kidney, taking out that which is bad and leaving that which is good, or to remove the organ *in toto*, with as much of the ureter as seems affected.

This question, as I have said, is one of interpreting accurately living pathology. Such interpretation is, I repeat, a matter of practice, of examining repeatedly hundreds and thousands of times living kidneys in perfect health, and living kidneys in more or less extensive disease. And when the question has been decided as accurately as it can be while the kidney is still in the body, shall the leaning be toward conservatism or toward radicalism? After removing the stones, shall we remove also the kidney, or that part of it chiefly affected, or shall we give the kidney a chance to heal and to make what contribution it can to the general bodily welfare?

I must admit again my adherence to Fenger's splendid principle of saving, by strenuous effort, all of the "royal tissue" of the kidney possible, and I must add my voice to favor, whenever possible, conservative methods. But, at the same time, I am sure that the decision between destruction and conservatism requires an experience and a knowledge

which few possess. At present the discrimination between the pathology which invites conservatism and that which demands destruction is an extremely nice one, beside which the decision for or against extirpation of the gall-bladder is crudeness itself.

I have saved kidneys which ought on the spot to have been sacrificed, and which later I was obliged to sacrifice. One of the patients suffered irreparable damage by delay, the other was no worse for the delay.[1] I have in the second case the great satisfaction of knowing that I did my best to save the kidney; but had the patient become generally tuberculous, like the first one, I should have regretted it all my life.

These two cases illustrate, however, the difficulty of the decision. I have several patients now whose kidneys I saved, and whom I am watching with misgivings for signs of additional trouble.

And yet the truth must be that kidneys are capable of conservation; that a half or a third of a kidney must be worth saving; that there is no more need of sacrificing the whole of a kidney when a part only is diseased than there is a similar necessity in any other organ.

My plea is for conservatism when there is a clear pelvis and ureter, and when the disease is not tuberculous—provided always that there is enough sound tissue left to make the effort worth while.

The ultimate results are, however, beginning to disquiet me. The chief source of discouragement lies in the recurrence of stone, either in the kidney from which a stone has been removed, or in the second kidney after extirpation of the first. I do not see how we can answer fully and satisfactorily our question as to the frequency and cause of recurrent renal calculi until our experience has been multiplied a thousand fold. For myself, I believe that the coming treatment of

[1] I was mistaken. When this was written she was at death's door, as I supposed, with hopeless tuberculosis. She is now in splendid health.

renal stone is an immediate removal by operation as little injurious to the renal parenchyma as possible, and by as clean and brief operations as possible.

Whenever the least question arises as to the condition of the other kidney, I believe that the incision should be carried through the peritoneum, so that its condition may be determined by direct palpation.

The deliberate breaking into the peritoneal cavity in an operation which is sure to be accompanied and followed by more or less escape of urine, sometimes septic, has always added, in theory at least, a menace which can easily be avoided by making the operation strictly extraperitoneal. But in nephrectomies I have made it an invariable rule to do this very thing, in order that I might determine beyond the shadow of a doubt the presence and state of health of the other kidney. In many there has been extensive soiling of the field by the pus of the infected renal pelvis, and yet I have seen no cases of general peritonitis follow.

There is much to be learned concerning the surgical diseases of the kidney, and the road for improvement and knowledge lies, as I have here indicated it in renal stone, along the path of the general practitioner into whose hands the earliest symptoms and treatment of the disease is sure to fall.

DISCUSSION ON THE PAPERS OF DRS. GOLDSMITH AND RICHARDSON.

Dr. G. E. Gavin, of Mobile, Alabama.—This is a very interesting subject to me for more than one reason. First as a patient, and second, as a surgeon. The etiology is of the greatest importance.

With reference to the paper by Dr. Richardson, I would like to say that the formation of stone in the kidney, I believe, is always preceded by an infection of the pelvis of the kidney, and the source of that infection may be the bladder, but I believe, most often it is from the colon. That

is my opinion, from what I have been able to gain by observation and investigation.

As to the matter of diagnosis, personally, I have been unable to rely upon the *x*-rays. At times, you will get evidence of stone by means of the *x*-rays, and when you do, it is good; when you do not, it means nothing. I have operated a number of times for stone in the kidney, and I have relied on the history just the same as I have relied on the history in gallstone cases.

As to the manner of attacking a stone in the kidney, I prefer to do so through the convex part of the kidney. I almost lift the kidney upon the back, place a rubber tube around the pelvis, control the hemorrhage thoroughly, make a longitudinal incision, and with very little blood lost one can deliver the stone. Before taking away the tube I suture the kidney with catgut if it is not infected, thereby producing deep compression; by so doing, you can control hemorrhages very well indeed, taking off the rubber tubing *after* you put in your deep sutures. I have removed stone from the kidney through the pelvic route successfully, stitching up the pelvis, with primary union. Where the kidney is much infected, I make it a practice of extirpating it.

I have extirpated five kidneys, with no deaths.

Let me say a word or two now from the standpoint of a patient. I am one of the unfortunates, in that I sacrificed my right kidney at the shrine of the stone, and successfully, as you all see, because I now weigh seventy-five pounds more than I did five years ago last July, when I was operated on. The infection, I think, in my case dated back to childhood. When eight years of age, I remember to have had a number of attacks of renal colic, which were then treated by the family physician for biliousness. I passed a number of small gravel.

The pain would seize me in the right side, lasting several hours, followed by boody urine.

While a medical student I was seized with a typical attack of renal colic, passed a stone into the bladder, but was unable to pass it from the bladder. Litholapaxy was resorted to in my case; considerable trauma was inflicted, and secondary violent infection occurred in my kidney. This went on for three or four years. I visited different physicians, and had my back burnt with the *x*-rays in trying

to find stones. I demanded the help of my friend Dr. Matas, and he made the operation very successfully, removing my kidney, with three stones in it. The kidney was ramified with cavities lined with phosphatic incrustations. There were crusts and stones enough to fill the average tumbler. The kidney would only go into a half-gallon jar. As you observe, I am living to tell the tale.

Dr. Charles P. Noble, of Philadelphia.—I feel that Association is to be congratulated on hearing this paper by Dr. Richardson, because it certainly is the soundest presentation of the subject I have ever listened to. I was particularly impressed with what Dr. Richardson said, that the surgeon should be the judge of the situation; that is to say, he should be the master of the laboratory man and not his slave. We have all profited by the work of the laboratory man, and have all suffered at his hands, as have also our patients, and we have had to take the consequences. I think it is particularly with the stone cases that this happens, and I heartily agree with Dr. Richardson that a well-studied history in these stone cases is the best guide to the diagnosis.

I remember very well a number of cases that I might refer to as illustrating this point. The wise man uses the laboratory man, but he is not controlled by him either positively or negatively. On the negative side I remember very well a patient upon whom I did a nephrectomy for stone in the kidney. The kidney was destroyed because a small stone had obstructed the ureter and brought about disseminated abscesses in the kidney. That patient had been in the hands of one of our professors of therapeutics in Philadelphia, who had treated her for three years for the gout, and he had failed to appreciate the importance of a careful study of the urinary organs by the modern methods. So he treated her for gout while her kidney was destroyed.

Another case which impressed me very strongly with the value of a good history, was one upon whom I operated about two years ago. The patient had a loose kidney which was painful. Of course, loose kidneys, as a general thing, are not painful; so I was suspicious that there was something in the kidney, in addition to its being loose. I thought I had a careful history, but the after-history was much more instructive than the previous history, because when I cut

down on the kidney I found she had one hundred and fifteen stones in it, and when we got the history later, it was shown that when she was twelve years old she had hematuria, and she had it at intervals until she was sixteen, and that subsequent to that time she never had hematuria. She did not mention this early experience. Although the urine was examined repeatedly she did not even have microscopic evidences of hemorrhage. And so, if we had taken the history correctly, we would have suspected the presence of stone and had an *x*-ray made.

I remember another case very well which, I think, is quite instructive as to the negative value of the *x*-rays. The case was reported by Dr. Edebohls in which a patient had been examined by three different expert radiologists, and each one got a shadow of three stones, supposed to be in her ureter because they were in relation one to the other in the course of the ureter. He operated on her and did not find any stones, nor did she have any dilatation of her ureter. He could not find anything to explain the shadow. After she got well he had her *x*-rayed over again. A new radiologist got a shadow of three stones in the ureter. For these and other reasons I think the judgment pronounced by Dr. Richardson is most wise, namely, that it is the history which is the most important, and it is the judgment of the surgeon that should make use of what physical diagnosis gives us the opportunity to do.

Dr. Bransford Lewis, of St. Louis, Mo.—I believe that if we were to attend the meetings of three different associations we would get three different impressions. If we attended a meeting of radiologists, we would learn that we can invariably make an exact and correct diagnosis of urinary calculus by means of radiography. If we attended a surgeons' convention we would get the advice as we have just heard, to rely on the history of the case for elucidating or making the diagnosis: and then, if we went to a genito-urinary surgeons' convention we would get advice to resort to cystoscopy and to ureteral catheterization as the means, par excellence, for reaching an accurate diagnosis. Personally, I would disagree with every one of these exclusives, because I would not rely on any one procedure for making a diagnosis, but would prefer to rely on the testimony furnished by all of them. If we go into the histories of cases,

we will find absolutely misleading features in them. Often there is transference of the symptom of pain or the kidney may be destroyed without there being any history of pain at any time. Further, experience in this line of work proves that there are errors committed by the use of the *x*-rays.

I have here in my hand two *x*-ray pictures that were taken; the patient had been through the hands of a general surgeon, who relied on the symptomatology in the case and took out the appendix. The removal of the appendix did not remove the cause of the patient's trouble, because she suffered for a year afterward, and a year after these *x*-ray pictures were taken, as beautiful an *x*-ray picture as you will find at any time was taken, showing four shadows in the pubic region, three of them due to stones, as I learned by subsequent cystoscopy, and a fourth shadow in the region of the left ureter, low down. There were four shadows, three in the mid-line of the pubic region, and a fourth apparently in the line of the left ureter; all of them were similar. At that stage I was called in. Here was a radiograph showing apparently stones in the bladder and in the ureter. When I learned the history, instead of relying on these two things, the history and the radiograph, I insisted on cystoscopy and ureteral catheterization plus the *x*-rays, and the result is shown in this picture (exhibiting) which shows the cystoscope in position, with three shadows in the bladder, and a fourth shadow lying *three-quarters of an inch from the ureter*, proving that there were three stones in the bladder, and *no stone in the ureter*. An *x*-ray taken of the catheters lying in the two ureters indicates that both ureters were clear, and I got the testimony of clear urine from the two ureters. The fourth shadow was from a phlebolith or some other kind of lith in the pelvis. Following the removal of the stones from the bladder, and washing out the right renal pelvis, the patient got well, having gained fifteen or twenty pounds.

These were definite mistakes made from the history of the case, the assemblage of the symptoms, and from the radiogram, but the condition was cleared up by investigation with the cystoscope in connection with radiography. My position is not to accept any one of these means of testimony alone, but to use them all, and to give them their proper place in the testimony. We should not use radiography

to the exclusion of ureteral catheterization, nor to the exclusion of a good history of the case, but should make use of all of them. That is the correct position to take in reference to making a diagnosis of urinary calculus. I can best illustrate the point that we should not rely on any one means in making a diagnosis, by mentioning one of the most remarkable cases I have seen. This patient had consulted a number of the best physicians that could be found. His case was never cleared up until ureteral catheterization plus the *x*-rays was resorted to, as well as plus a laboratory investigation, which demonstrated the existence of a third ureter. I have a radiogram here (exhibiting) showing the three ureters with styletted catheters *in situ*. The patient is still alive. One of these three ureters was infected with gonococci, and as a result, for five years there had been recurrent gonorrhea of the lower urinary tract, and the patient showed no signs of getting well until the infected third ureter was washed out with a ureteral catheter. The diagnosis in this case was made by recourse to these several different means.

Dr. F. W. Parham, of New Orleans.—I want to make one or two remarks in connection with kidney stone. I have been impressed with the remarkable absence of pain and other subjective symptoms in cases where there were very large stones in the kidney. I was particularly impressed with that fact about three weeks ago, when I operated upon a woman for a large stone in the pelvis of the kidney branching up into the calices. This large stone was fixed, so that it took quite a large L-shaped incision to dig it out. The woman had had scarcely any pain, but she passed pus in the urine, and while there were signs of trouble, the trouble was not excessive.

I know of another case in which there was a much larger stone in the kidney, as shown by radiographic investigation. The man has had it there for several years, and refuses to have anything done, because he gets along quite comfortably. Of course, if infection takes place, he will have a great deal of trouble, and perhaps his kidney will rapidly disorganize.

The next point I wish to call attention to, is the necessity of not relying upon any one means of diagnosis, as Dr. Bransford Lewis has insisted on. In this case, if I had relied simply on the clinical history and presentation of the

case, I should not have operated, although our Fellow, Dr. Ransohoff, insists, and believes that the diagnosis can be made positively by the discovery, on repeated examinations of the urine, of red blood corpuscles. We did suspect it from these repeated examinations, but I did not operate upon this patient until I took a radiographic picture. It showed a large stone, which was true to life, as shown at the operation, and in addition to that, there was the picture of a stone in the ureter, apparently down near the brim of the pelvis. In doing the operation, I took out the kidney without difficulty, brought it fully out onto the abdominal wall; found the stone in the pelvis of the kidney, and made an incision just above the hilum of the kidney through the substance of the kidney, but found I could not deliver it there. I then made an incision, L-shaped, up toward the convex portion of the kidney, finding the stone, as shown in the radiograph. This stone was so true to the *x*-ray picture that I concluded to prolong the incision and go down and hunt for the ureteral stone, also shown so well on the plate. This was found without difficulty. Fortunately, I was able by putting a finger on each side of the ureter to strip it up within two inches of the kidney; I removed the stone through a small incision, and sewed up the ureter. In two weeks the woman was able to go home. There was considerable hemorrhage during the operation, and I found it most embarrassing by far of all the difficulties in the operation. The forceps which I had were not quite long enough to grasp the pedicle of the kidney.

I want to call attention to another point, showing the value of radiographic investigation in these cases. We save time in the investigation of the kidney at the time of the operation; if the *x*-ray picture is of value as showing the existence of stone, it will show all the stones, and when you have found all the stones which are shown on the radiographic plate, I think you can take it for granted, that when they are removed the operation is completed and I think, therefore, we ought not to decry any one method of examination. In these cases I do what I think is necessary, and go on the theory that we must have as much knowledge of the condition of the other kidney as we can get, and not wait for an abdominal exploration to determine whether the other kidney exists, or whether it is healthy. I believe,

therefore, as Dr. Bransford Lewis has so strongly insisted we should rely upon no one method of investigation, but avail ourselves of all. I do not think we should minimize the value of the laboratory report, the *x*-ray examination, or any other laboratory investigation that may be of use to us. I think it is well to bear in mind that some stones do not cast a shadow as distinctly as others. For instance, uric acid stone casts a very slight shadow, so that a stone must be of some size, in order to cast a shadow on the radiographic plate. A phosphatic stone casts a much darker shadow, and with radiography, phosphatic stones are much more easily discovered.

Dr. Arthur Dean Bevan, of Chicago.—I have been very greatly interested in Dr. Richardson's paper, and in the discussion which has followed. Briefly speaking, in our clinic we have done a good deal of kidney stone work, and I have been much impressed with this fact in connection with that work, that it is an example of surgical work which demands a division of labor. It is a branch of surgery which cannot be done in all its details properly by any one man. Good kidney stone work demands first, a good surgeon. I think we should put him at the top of the list as the most important factor in the play. It demands as the second man in the play an expert in the use of the *x*-rays. The *x*-ray is the most reliable agent that has been employed in connection with the diagnosis of kidney stone. It is so reliable that, without any hesitation, we can say, when properly employed, it will give much less than 10 per cent. of error. It must be handled, however, by an expert. We have had this experience repeatedly of having *x*-ray pictures brought to us which showed nothing, and the doctor would say, "Here we have taken an *x*-ray picture and it shows no stone." Very often it does not even show the transverse processes of the lumbar vertebræ. It seldom shows the line of the psoas muscle, and seldom shows a differentiation which is necessary for fine *x*-ray work. Now, the best *x*-ray work cannot be done by the average surgeon any more than the average *x*-ray man can do expert surgical work. It must be done by a highly-trained man who is devoting all his time to this work, in order to obtain the best results. The surgeon, however, should interpret that work. I would not accept as final the interpretation of an

x-ray plate by any *x*-ray man who ever lived, so far as I am personally concerned. The surgeon should be thoroughly posted in the interpretation of what the *x*-ray shows and in all the possibilities, he is the man who should interpret what is found on the *x*-ray plate. A third man in the play is the one who can make an expert cystoscopic examination, and who can, with the least risk of infection to the patient, with the least discomfort to the patient, catheterize the ureters. The fourth man, unless the surgeon desires to do it himself, is an expert laboratory man, who makes the careful analyses for tubercle bacilli, etc., in the urine. I should say that in a first-class clinic those four people are absolutely indispensable, and that such a division of labor is absolutely necessary to the best kidney stone work. With such measures I believe that splendid work can be done in kidney surgery with a small amount of error, certainly less than 10 per cent., so far as the *x*-ray work is concerned, provided the surgeon understands and interprets the *x*-ray findings correctly.

One point has been brought up here on which I can throw a little light, and that is the question of bodies which are found in connection, usually with the spine of the ischium. In a hundred plates taken of the pelvis in the adult, without any reference to kidney stone work at all, in twenty-six of them showing good differentiation, these bodies were found in the pelvis. My associates, Dr. Joseph Smith and Dr. Dean Lewis, and myself made an investigation which proved interesting. In all the bodies we ran down carefully, they were centres of ossification in the pelvic ligaments, usually opposite the spine of the ischium.

Last Thursday in the clinic a case was brought to me with a history of stone in the right kidney, and the *x*-ray picture showed one of these bodies. It was a very good *x*-ray picture, taken by a physician outside of the hospital. I had my *x*-ray expert take at once an *x*-ray picture, which confirmed the presence of the body. Dr. Herman Kretschmer, who is doing cystoscopic work in our clinic, passed a catheter into the ureter, and thought at first there was no stone, as the catheter slips in without being obstructed. The patient with the catheter in the ureter was then sent to the *x*-ray laboratory again, and a very beautiful picture obtained, showing the catheter passing alongside of the stone

in the ureter, proving definitely that the shadow was a stone in that position. Through a muscle-splitting incision, like the appendix incision, except the peritoneum was not opened, and pulling the ureter up with a couple of blunt hooks, the stone was easily removed.

This point should be emphasized in connection with the treatment of kidney stone: Where possible, we should be prepared, before kidney stone operation, to remove the infected or the involved kidney, if necessary. That requires determination of the kidney sufficiency of the individual in general, and the kidney sufficiency of that kidney if it can be determined before operation. I think along these lines the greatest progress will be made in the future, in the way of making a complete cure, at a single operation in the particular case. I have myself so much confidence in the *x*-rays in this work, that where we find a patient in good condition and a definite shadow of a comparatively small stone in one kidney, we do not hesitate to proceed at once to an operation, and, as a rule, make pyelotomy and remove the stone from the pelvis. If there is evidence of infection or of multiple stones, or if it is a large stone filling the pelvis and calices, we determine the kidney sufficiency before operation. We place a great deal of emphasis upon the twenty-four-hour specimen of urine, with total solids, and also lay stress on catheterization of the non-involved side, and at the time of the operation the gross appearance of the kidney itelf. For instance, if at the time of the operation we find a kidney which is evidently grossly diseased, and contains stones, and with little secreting substance, if the total urinary output has been normal, if the kidney sufficiency has been determined by the phloridzin test and cystoscopy to be sufficient, we do not hesitate to remove the kidney at the primary operation.

Dr. Stuart McGuire, of Richmond, Va.—While listening to this admirable paper and discussion, I recall three cases that have occurred in my practice which illustrate that in suspected ureteral calculus to arrive at a correct conclusion, we must have the combined opinions of four different observers—the surgeon, the pathologist, the cystoscopist, and the radiologist. These three cases were so identical that the history of one will suffice for all.

The three patients came with histories and with symptoms

which were equally indicative of appendicitis or of stone in the right ureter. In all three there was a large quantity of blood and pus in the urine. The ureters were catheterized, and the left side was found in each case to be normal; while the right side was found to contain blood, pus, and cells from the ureter. Up to this point the evidence seemed in favor of ureteral calculus. An *x*-ray was then made, but no stone could be detected. Therefore, the operation for appendicitis was performed, and owing to the interest in these cases the appendix was exposed without disturbing its position, and in each instance a large, angry appendix was found, adherent along the line of the right ureter.

Evidently, therefore, the inflammation originating primarily in the appendix, had extended by continuity of tissue to the ureter, causing ureteritis, and this explanation was confirmed by the fact that within a week after the operation of appendectomy the urine was clear, and all symptoms were completely and permanently relieved.

In closing the discussion I hope Dr. Richardson will explain the charatcer of the incision he employs in these cases. Last summer, while in Boston, I had a talk with him about kidney work, and he expressed views, which, I am sure, will interest the members of the Association.

Dr. Richardson (closing).—Owing to the limited time, I omitted many pages of my paper which contained an elaboration of all of the arguments that have been made in this.

I am particularly pleased that Dr. Lewis and Dr. Bevan take the same view I have expressed, namely, that the surgeon is the final judge, after he has used all these diagnostic methods. Of all these, the *x*-ray in the hands of an expert is perhaps the most valuable aid. Personally, however, I regard as most important, a good history of the case that suggests stone. I mentioned a case of stone found at autopsy in a man who was operated on in 1886 for a stone in the bladder, but died suddenly of uremia in 1907. The left kidney was found full of stones, the existence of which the patent had never for a moment suspected. Unless we have a history of pain, we are not likely to subject a patient to the use of the *x*-ray and other tests. I distinctly stated that in these cases we should call to our aid the services of an expert in cystoscopy and ureteral work. The *x*-rays, like other aids to diagnosis, is fallible. I want it clearly understood that in my paper I am talking about the diffi-

cult and not about the easy cases. I pointed out that an ordinary stone in the kidney is so easy of diagnosis that it is hardly worth talking about. I was speaking of stone in the kidney which we do not know about, which we can only suspect. In connection with diagnosis I might mention some recent experiences. In one case there was a history of stone in the kidney, but the *x*-ray expert said that there was no stone. The patient was brought to me by a physician who said, "I don't care what the *x*-rays say; I know that man has a stone." At the operation we found a stone in the kidney, although the *x*-ray findings were absolutely negative. We did not have any ureteral work done in this case. The man made a beautiful recovery from the operation, and shortly thereafter gained thirty pounds in weight. Subsequently there was a recurrence of pain. Then the *x*-rays showed four more stones in the kidney. The patient had considerable pain, and there was blood in the urine. I opened the kidney by a longitudinal cut and found but one stone. In my search the kidney was so badly damaged that I took it out. I broke my own rule, namely, that no matter what the ureteral catheter says, I will not take out one kidney until I know the patient has another, or something that feels like it. As I say, we found only one stone. Where the other three stones were or are, I do not know. Much to my relief, the patient passed urine in a few hours, and made a good recovery.

In another case in which there was a history of stone in the left kidney, I had one of our experts introduce the ureteral catheter and make a careful examination with the cystoscope. He did so, and found urine coming from the left as well as from the right kidney. The *x*-rays showed nothing in this case. The ureteral catheter, however, showed that this kidney was secreting a certain amount of urine, but how much I do not know. From the history of the case I felt absolutely sure that the man had a stone in the kidney. There was good reason to believe that he had a stone because he had passed several. There was no left kidney, but a horse-shoe kidney, with a stone and a ureter near the median line. There was undoubtedly another ureter. The left ureter was tightly plugged with a stone.

In a third case the history was strongly suggestive of stone in the kidney. The *x*-rays showed nothing. On going in by a long incision, we found nothing in the kidney per-

ceptible to the touch. Ureteral examination showed nothing. We searched for the appendix and took it out—an enlarged and thickened one. My attention had been first drawn to ureteral stones, by cases in which surgeons had taken out the appendix, and in which I found, subsequently, that the real trouble was owing to a stone in the right ureter. I therefore explored this kidney carefully, and, in accordance with the suggestion of Dr. J. William White, split the capsule of the kidney and make a thorough examination of the cortex and pelvis. I could feel nothing in the ureter. This operation was done three months ago. Just before I left Boston, I learned that the patient was absolutely free from pain.

The most valuable contributions we can make to such a discussion as this, are our own personal experiences, with special emphasis laid on the unusual thing. I do not wish to be understood as criticising ureteral work, the use of the cystoscope, the use of the *x*-rays, or the urinary examination; but I have shown fallibility in every one of them. How does a jury arrive at a correct verdict? By weighing the evidence. Everything is fallible, and all evidence must be weighed. In making a diagnosis I try to do so in a thorough and painstaking manner. If I then operate and find nothing, my conscience is clear, for I have done the best I know how for the patient.

Dr. McGuire asked me to say a few words with reference to the location and character of the incision. The patient is placed on the side, and through the external oblique a long incision is made near enough to the brim of the pelvis to enable the operator to get behind the peritoneal reflection of the ascending colon. The colon is then retracted far enough so that a sufficiently large opening to do most kidney work can be made. I have had no difficulty in getting the kidney out through this incision or in doing all the work that is necessary in any easy case. I have seen a patient die of hemorrhage practically upon the table after the delivery of the kidney through an incision in the back along the quadratus lumborum on the right side. I do not think that that incision permits the surgeon to gain immediate access to the great vessels of the kidney. The incision I have described is one that I like for anatomical reasons: it does less harm, and it gives the best access to the part in case of hemorrhage.

PORRO-CESAREAN SECTION, OCCASIONED BY LARGE MULTILOCULAR OVARIAN CYST COMPLICATING PREGNANCY. RECOVERY OF MOTHER AND CHILD.

By F. D. Smythe, M.D.,
Memphis, Tennessee.

Mrs. P. H., aged twenty-eight years, residence, Tupelo, Mississippi. Referred by Dr. T. T. Bonner, of that place. Occupation, housewife. Dates illness from July 1, 1907. Married eight years. Began menstruating at the age of fourteen, periods recurring every twenty-five days prior to onset of trouble. A few times since trouble began period appeared on twenty-first day and once went thirty-two days. Duration of period, three days. Amount normal. Last period began November 26, 1907, and continued four days. Has had no children, though two abortions, first March, 1901, at twelfth week, remaining in bed two weeks, getting up well with exception of a general weakness. Second abortion October, 1905, at eighth week, remained in bed one week, getting up well with exception of pain in back.

She remained well until July 1, 1907, when she noticed some abdominal distention low down, inclining to right side. The lower abdomen became rapidly enlarged after swelling was first observed. The patient was very uncomfortable, especially while lying on back. One month after swelling was first observed the enlargement was so pronounced that it was with difficulty that her clothing could be fastened. Her general health, however, remained good and her periods continued to appear regularly, the last period occurring November 26, 1907, ending November 30. She missed

December and January; other signs of pregnancy absent. On February 3, 1908, a bloody discharge appeared from the vagina which she regarded as a return of her monthly sickness. It was scanty on and off every first, second, or third day for thirty days when it ceased.

Distinct quickening was felt April 10, 1908, the abdomen at this time was very large and much more generally enlarged, but still more pronounced on right side. General health good and delivery expected daily by interested parties on account of the size of abdomen.

August 15, patient was admitted into the hospital where I saw her and obtained the above history. Diagnosis of pregnancy complicated by ovarian cyst was confirmed by digital and stethoscopic examination. She was apparently well nourished and perfectly helpless and had been so for the past three months. The abdomen was unusually distended, reaching below her knees. Respiration and heart's action embarrassed. Mild surface edema, kidneys acting freely, urine containing a trace of albumen and a few casts She was extremely uncomfortable and begging for relief.

On the morning of August 18, after due preparation the operation was performed—twenty days ahead of time—date of expected confinement, September 7.

A long incision was made in the median line, the wall of cyst presenting prominently when peritoneal cavity was entered. Several gallons of fluid were drawn off with trochar before the cyst could be delivered through incision. The total quantity removed was eight gallons. The cyst grew from the right ovary and had a small pedicle.

After its removal the uterus was delivered well out of the abdominal cavity, my assistant exerting bilateral abdominal pressure. Incision was made in median line of uterus, the ischemic zone (uterus here exhibited). The child was in the right occipitoposterior position. After rupturing the membranes the cord was caught with two snaps and divided between them, the child extracted and turned over to an

assistant. It was a male and weighed seven and three-quarter pounds. The placenta was removed without delay or difficulty. The pulse, at this time, was 160 per minute and the prospects of getting her off the table alive was none too bright, though blood loss had not been of consequence. Supravaginal hysterectomy was done as quickly as possible. Mikulicz drain was directed through dilated cervical canal into vagina as a safeguard against retention of secretions, being extraperitoneal after completion of pelvic toilet. Time consumed in operation, including the removal of cyst, Porro-Cesarean and closure of incision, twenty-nine minutes.

Post-operative treatment was practically the same as is carried out in the management of an ordinary supravaginal hysterectomy. The infant was applied to the breast six hours after operation. Milk appeared on the third day and the mother nursed the child regularly thereafter.

The case progressed normally for two weeks, when the patient complained of severe pain along the course of the right saphena. The entire leg became swollen and afforded considerable trouble for two weeks. Phlebitis developed in the saphena of left leg, though did not produce swelling and lasted but a few days.

Four weeks after operation the patient returned to her home. A letter from her husband dated November 16, says: "The boy weighs twelve pounds stripped, and the mother is able to attend to all its wants, spending her spare time in health and happiness, as every one in health should."

The Porro-Cesarean was the operation selected in this case, and not the Sanger, or so-called conservative operation, for the following reasons:

1. The most important; the rapidity with which the Porro could be performed increased the chances of the patient surviving the operation.

2. The remaining ovary was cystic, and in all probability a cyst of the same character as the large one removed. Such cysts being bilateral in 4 per cent. of cases, and to have per-

mitted it to remain in the event of recovery of the patient, would have been to invite a second operation in the near future with its risk to life and effect on purse.

3. This patient was in a condition too much weakened to be subjceted to any avoidable risk of the puerperium, hence the Porro. The Sanger could not have provided the protection which was essential to the salvation of my patient.

4. There will always occur cases demanding the Cesarean section in the interest of the child, also in the interest of the mother. In elective cases there should be no infant mortality attending either operation. Hence, the surgeon should select the operation that subjects the mother to the least risk of losing her life. The essayist is fully convinced that the Porro is the safer operation, and that the surgeon performing the Sanger in an honest effort to preserve the reproductive organs will have occasion to congratulate himself now and then at the result of his efforts in that plausible undertaking, but he cannot escape the responsibility of the loss of a mother at times, due to his plan of management, whose life could have been saved had the simpler and safer operation been selected at the outset.

5. Myomectomy is attended by a higher operative mortality than supravaginal hysterectomy. Hysterotomy or the Sanger operation is likewise more hazardous than the Porro for the same reasons, namely, sepsis and hemorrhage. During the puerperium with an expanding and contracting uterus the dangers from both sources are greatly increased.

The surgeon's first duty is to his patient and only after that duty shall have been fully discharged is he at liberty or justified in considering future generations. So, until I am convinced that the so-called conservative operation is as safe to the mother beyond question as the Porro it will be my practice to choose the latter.

ELECTIVE CESAREAN SECTION.

By Miles F. Porter, M.D.,
Fort Wayne, Indiana.

It is proposed to discuss in this paper the Cesarean section as an operation of choice, and more especially to discuss the advisability of doing this operation in patients who are usually delivered by so-called minor operations or by unaided natural forces after prolonged labor.

In reaching correct conclusions, the mortality and morbidity of both the child and the mother are the important factors. Heretofore too little attention has been paid to the life of the child, and too little to the morbidity of both the mother and the child.[1] This is a question not only of motherless children but a question also of invalid mothers and idiot children. That a mother gets through labor with her life and that the babe be born alive is not sufficient. The aim should be to conduct the labor so that neither shall be harmed thereby. There must be nothing in the labor per se which will prevent the mother from complete recovery or the child from developing into a normal human adult.

Let us first inquire as to the infant and maternal mortality attending the high application of the forceps, version, and extraction of the child, the induction of premature labor, and the expectant plan in women with narrow pelves. Forceps

[1] Craniotomy on a living viable child, unless it be a monster, is regarded by the writer as an entirely indefensible procedure, the opinions of Katz, Pfannenstiel, and others (mostly Germans) to the contrary notwithstanding.

version, and induction of premature labor, according to Zinke,[1] result in a maternal mortality of 10 per cent. and a fetal death rate of 50 per cent. Reiman[2] says that with proper precautions the high application of forceps results in no maternal mortality and in a fetal mortality of 10 per cent. E. P. Davis[3] places the maternal mortality at 58 per cent., and the infant mortality at 15.63 per cent. He says that "the high application of the forceps is especially dangerous for the child in contracted pelvis." In the Breslau[4] clinic the high application of the forceps showed no maternal mortality which could be traced directly to the use of the forceps, but a fetal mortality of 31 per cent. Induced labor in this clinic resulted in maternal mortality of zero, and a fetal mortality of 28 per cent. In the Berlin, St. Petersburg, and Budapest clinics[5] the maternal mortality in high forceps ranges from zero to 6.5, and the fetal mortality from 20 to 30 per cent. According to Lusk[6] the fetal mortality in "slightly contracted pelves" with spontaneous birth is 13 per cent., while Playfair[7] puts it at 20 per cent., and Schroeder says that if the contraction is enough to indent the head of the child 50 per cent. will die. Version in contracted pelvis gives, according to Nagel, quoted by Hirst,[8] a fetal death rate of 25 per cent. or moe. According to Hirst[9] the induction of premature labor two to four weeks before the expected termination of pregnancy in cases with a conjugate diameter not lower than 9.5 cm., entails no additional risk to the child if conditions are such as to permit it to have the best care, and is followed by no maternal mortality in his experience in private practice. He calls attention, however, to the fact that in the discussion which occurred at the International Congress in Amsterdam in 1899 the maternal mortality was acknowledged to be 1 per

[1] President's address at Twenty-first meeting of American Association of Obstetriction and Gynecologists, Baltimore, September 22, 1908.
[2] Progressive Medicine, September, 1908.
[3] Loc. cit.
[4] Loc. cit.
[5] Loc. cit.
[6] Dorland, Modern Obstetrics, p. 572.
[7] Loc. cit.
[8] Text Book of Obstetrics, p. 516.
[9] Loc. cit.

cent. and the infant mortality was given by Barnes as 33 per cent., by Bar and Herzman as 26 per cent., and by Becker and Black as 50 per cent. In cases of normal pelves the fetal mortality following the use of forceps is, according to Leisenwitz[1] quoted by Davis in the article already referred to, 14.28 per cent. This author also states that he found practically the same results following use of forceps with the head in the pelvic cavity and at the brim. Eliminating all but mechanical complications, he found a fetal mortality of 10.68 per cent. and a maternal mortality of 0.58 per cent.

Let us now consider the question of morbidity of mother and child in this same class of cases. Again, we turn to Davis' review of the literature in *Progressive Medicine*, and find that Leisenwitz says that 73.6 per cent. of the mothers were injured to such an extent as to require suture, including injuries to perineum, bowel, and bladder. Aside from fractures, the percentage of which he does not give, he found that 5.45 per cent. of the children had facial paralysis and 1.15 per cent. had paralyses of a nerve plexus.

Rieman[2] gives the particulars of the use of the high forceps in 100 cases in Baum's clinic. Of the women, 16 per cent. had a febrile puerperium, and in 7 per cent. there was serious injury of some kind, while of the children, 22 per cent. were born dead, and 10 per cent. were seriously injured. Instrumental interference is assigned by Suttleworth[3] as the cause of idiocy in 29 per cent. of the cases admitted to the Royal Albert Asylum. Down[4] says that in 20 per cent. of 2000 idiots examined by him there was evidence of suspended animation at birth. Crichton Browne[5] also emphasizes protracted and abnormal labors as a cause of idiocy and other mental diseases. An examination of the birth records

[1] His conclusions are based on a study of 27,238 labors in which the forceps were used in 2.55 per cent. of the cases.

[2] Journal of the American Medical Association, xlviii, p. 2082, abstract.

[3] British Medical Journal, January 30, 1886.

[4] Transactions of Obstetrical Society of London, December, 1876.

[5] West Riding Lunatic Asylum Reports, vols. i and ii.

of the Indiana School for Feeble-minded Youths, kindly made for me by Dr. H. K. Mouser, shows that the percentage of difficult labors in 727 cases in which the birth record is given, is 11.69, including all the grades, and of the epileptics there is a history of difficult labor in 17.64 per cent. of the cases. The investigations of Carmichael[1] and others show that cerebral hemorrhage in the newborn is due not to instrumental aid in delivery, but to the conditions which made such aid necessary. Of 14 cases of cerebral palsy studied by Carmicheal, in all but two the labor was long, and in 8 there was marked asphyxia. He regards asphyxia as the exciting cause, and cranial compression as the contributory cause.

As pointed out by Frazier,[2] if these children recover from the immediate effects of the hemorrhage, they almost invariably suffer permanent physical disability, and it is said that in 30 per cent., epilepsy develops. McIlrath[3] found that of 250 cases of infantile convulsions, abnormal labor was the cause in 10 per cent. Kulnig, Gowers, and others have emphasized the close relationship between congenital palsies and epilepsy, which, taken together with the close relationship known to exist between birth injuries and congenital paralysis, increases the importance of prolonged and difficult labor as a cause of epilepsy.

Summarizing the foregoing figures, we find that the average maternal mortality resulting from high forceps, version, induction of premature labor, and expectancy as given by fifteen authors is 1.14 per cent., and the fetal mortality 17.3+ per cent., while from these same figures we find that there was serious maternal morbidity in 42 per cent., and a serious fetal morbidity of 12.2 per cent., not including the fractures of the skull in Leisenwitz's figures.

[1] Scottish Medical and Surgical Journal, June, 1906.
[2] Progressive Medicine, March, 1907. [3] Ibid., 1908.

Name of operator.	No. of cases.	Indications.	Deaths maternal.	Deaths infantile.	Morbidity maternal.	Morbidity in child.	Remarks.
J. G. Lynds, Ann Arbor.	3	Placenta previa, 1; narrow pelvis, 1.	0	0	?	?	One patient since confined and again pregnant.
Jos. B. DeLee, Chicago.	19	Mechanical disproportion, 13; vaginal stenosis, antefixation, placenta previa, pelvic tumor, each 1; eclampsia, 2.	2	2	9	0	Two stitch abscesses, four mothers had fever, one had jaundice, one temporary ileus, one had hernia following second section; operated second time on two: one death from eclampsia; one tumor case died; fetal deaths, two; one due to ignorant assistant, and one diseased at birth from hypothyroidism in mother.
Wm. J. and Chas. Mayo, Rochester, Minn.	2	Not given.	0	0	0	0	
J. H. Carstens, Detroit.	5	Pelvic deformity, 4; tumor, 1.	0	0	0	0	
W. A. Newman Dorland, Philadelphia.	2	Immaturemother, 1; rachitic pelvis, 1.	0	0	0	0	
J. F. Baldwin, Columbus, Ohio.	10	Contracted pelvis.	0	0	0	0	One pair twins.
S. J. Goodwin, Columbus, Ohio.	1	Contracted pelvis.	0	0	0	0	
E. H. Grandin, N. Y.	3	Not given.	1	0	0	0	Death due to uremia.
Joseph Price, Philadelphia.	4	Malformation, 3; eclampsia, 1.	0	0	0	0	
Ed. P. Davis, Philadelphia.	44	Disproportion between child and mother.	1	0	5	0	One hematoma; one odorous vaginal discharge; three stitch abscesses. Silk for sutures and ligatures. Death due to peritonitis of unknown source. Two delivered second time, and in both hysterectomy done.

Miles F. Porter, Fort Wayne.	2	Pelvic tumor ovarian, 1; placenta previa, 1.	0	0	0	0	The tumor case was a multipara, but after delivery of tumor it was thought better to deliver child by section. This woman has since been delivered normally. Placenta previa case was a primipara operated after only two vaginal examinations, and after one fairly free hemorrhage. Dr. L. P. Drayer was the physician in charge in this case, and it was he who made the diagnosis and advised the operation, and to him belongs the credit for the fact that this patient is today the healthy mother of a hearty baby.
A. P. Condon, Omaha.	5	Placenta previa, 3; fibroid, 1; narrow pelvis, 1.	0	2	Not given	Not given	One child lived eighteen and one forty-eight hours after delivery; one delivered at seven months; one placenta previa case has since been confined normally.
F. S. Newell, Boston.	26	Rigid soft parts, elderly primipara, 1; disproportion, 25.	0	0	3	0	In three cases this was the second or third section, two others were subsequently delivered by section by other operators; one case had ether pneumonia, one a phlebitis, and one case had eclampsia, and during convulsion opened wound and extruded bowels, but recovered.
Totals[1]	126		4	4	17	0	

[1] Adding Zinke's report, which came too late to be incorporated in the table, we have a total of 133 Cesarean sections, with four maternal and four fetal deaths, 17 cases of maternal morbidity, and no fetal morbidity, and four of the mothers have since been delivered through the normal channel without accident.

I want also to append a synopsis of the report of Dr. E. J. Ill, which came after the paper was finished. In all, 33 cases have occurred in the service of Drs. E. J. and Charles Ill. There were six maternal and nine fetal deaths. Of the maternal deaths, one was due to sepsis present at the time of the operation, which was done after forceps and version had both been tried and failed, two were due to eclampsia, which was the indication for which the operation was done, one death from sepsis occurred in a case of deformed pelvis with albuminuria, one death occurred in a patient operated for concealed hemorrhage with cicatricial contraction of the vagina, and one in a case of narrow pelvis in which the cause of death is not given. Of the children born dead, seven died in utero, and the remaining two deaths were born of mothers in eclampsia. One woman was operated twice, and has two living children, and who, prior to the first section, had been delivered four times of stillborn babies. One of the women operated has since been confined twice normally, and one, once. The total maternal mortality, including all cases in this series, was 18 per cent., and the fetal mortality, also including all cases, was 27 per cent. Correctly interpreted, Dr. Ill's results strongly emphasize the advisability of more frequent resort to Cesarean section as an operation of election. Dr. E. J. Ill deplores the fact that "it seems so difficult to get the young men started at it."

It is well to recall here the opinion of Frazier, above noted, that the children who recover from cerebral hemorrhage invariably suffer permanent physical disability, and that in 30 per cent., epilepsy develops.

Through private correspondence, I have collected from thirteen operators, reports of 126 cases of elective Cesarean section done on uninjured, uninfected, unexhausted women. Four were done for tumor of the pelvis, and the tumor was removed at the same time the Cesarean section was done in three cases, and in one this point is not covered in the report; 6 were done for placenta previa, 3 for eclampsia, 1 for rigidity of soft parts in a primipara, 1 for uterine distortion due to ventrofixation. The remaining 110 were done for contracted pelvis. In this series of cases there were 4 maternal deaths (3.1+ per cent.), 4 fetal deaths (3.1+ per cent.), 17 cases of morbidity in the mothers (13.49+ per cent.), and no fetal morbidity.

Summarizing these figures, as was done in those given concerning forceps, version, etc., and eliminating 4 fetal deaths which were in nowise due to the operation, and 2 maternal deaths due to uremia, but including one maternal death following the removal of a tumor plus Cesarean section, which death might with equal fairness be attributed to the removal of the tumor, and we find that we have a maternal mortality of 1.58 per cent. for Cesarean section, as compared with a mortality of 1.14 per cent. for high forceps, version, etc.; a fetal mortality of zero for Cesarean section as compared with a mortality of 17.3+ per cent. for high forceps, version, etc.; while the maternal morbidity in Cesarean section is 12.69 per cent. as compared with a maternal morbidity in high forceps, version, etc., of 42 per cent.; and the fetal morbidity in Cesarean section is nil as compared with a fetal morbidity, in many instances worse than death, of 12.2 per cent., excluding the skull fractures in Leisenwitz's cases. These cases have been tabulated, and the table is appended, as it contains some details which are not mentioned in the paper.

The possibility of error in drawing conclusions from so small a number of cases (126) is fully recognized, but inasmuch as the mortality and morbidity as arrived at from these cases agrees closely with the opinions of a large number of men of experience on these same points, I think that the deductions above given may be regarded as practically correct.

In recent private letters, the Mayos, Newell, Price, Hirst, Dorsett, and Grandin express the opinion that Cesarean section done under favorable circumstances by competent operators should give practically no mortality nor morbidity. Condon places the maternal mortality at 2 per cent. The following are some of the opinions expressed by the authors in personal letters to the writer:—

Lynds, of Ann Arbor, says, "It would seem as though the operation (Cesarean section) done under fairly favorable circumstances is comparatively safe and possibly should be done for placenta previa oftener than it is done at present."

Hirst says, "As between high forceps and version in primipara, and Cesarean section, the expert abdominal surgeon would get the best results with the last, even though he were also an expert in the other operations, but this would not apply of course to the general practitioner."

Newell, of Boston, speaking of Cesarean section, says, "In the first place the elective operation done before labor, in the absence of complicating disease, with the patient in good condition, is, in competent hands, a safe surgical procedure, and I believe the morbidity in these cases is very slight and certainly very much less than could be claimed for the ordinary obstetrical operation in the same class."

De Lee thinks that "Cesarean section ought to have a wider field and should replace many of the brutal forceps and version operations."

According to Davis, "Elective Cesarean section by competent operators upon uninjured and uninfected patients in good condition, gives at the present time the best chance

of life and health to mother and child, in cases where mechanical disproportion or physiological incompetence to endure labor are markedly present."

Eliminating those deaths for which the operation was in no way responsible, we find the maternal mortality of Cesarean section in Schauta's[1] clinic is 2.85 per cent. Kerr's[2] mortality is 6.6 per cent. in 30 cases, Leopold's[3] 4.9 per cent. in 229 cases, while 80.8 per cent. of the children thus delivered lived to be eight years old. Wallace[4] reports 15 cases with neither fetal nor maternal mortality. He has done 16 operations in all, one of which died from sepsis due to attempts at delivery before section was done. Zinke, in his paper above referred to, says: "Zweifel is credited with 55 Cesarean sections, with the loss of only one mother, Schauta with 111 Cesarean sections and but one maternal death. The latter operated seventy-five times for relative indications and all mothers lived." In a private letter from Dr. Zinke, which came too late to be used in the table, he reports 7 clean cases of Cesarean section without a death. His maternal mortality in high forceps is 8 per cent.; in prophylactic version, 3 per cent. His fetal mortality in those operations is 12 per cent. and 23 per cent. respectively, and the maternal morbidity 40 per cent. and 35 per cent. Further proof of the facts deduced from the cases in the table is unnecessary.

Concerning maternal morbidity, there can be no doubt but that it is less after Cesarean section than after the other methods of delivery under discussion. So far as concerns the child there is no method of delivery which subjects it to as little risk as does Cesarean section.

In the treatment of placenta previa, version, metreurysis, and the use of Bossi's dilator are the methods preferred at

[1] Journal of the American Medical Association, September 22, 1906, abstract.

[2] American Journal of the Medical Sciences, September, 1906, p. 174.

[3] Progressive Medicine, September, 1908.

[4] Journal of the American Medical Association, April 13, 1907, abstract

present. Bossi's dilatation has failed to reduce the mortality in either mother or child, and adds materially to morbidity of the mother as compared to other methods of dilatation. According to Zinke, the various methods above mentioned result in a maternal mortality of 8 per cent., and a fetal mortality of 70 per cent. Hirst places the fetal mortality at 50 per cent. Holmes,[1] in a paper in which he attempts to show that Cesarean section is improper in placenta previa, gives the fetal mortality under so-called obstetric treatment as 54.1 per cent., and the maternal mortality as 7.36 per cent. He further states that Cesarean section in placenta previa has reduced the fetal mortality 30 per cent., but has raised the maternal death rate threefold.

Let us stop for a moment to weigh those statements. In estimating the value of the child's life as compared with the mother's, it is entirely proper to consider the fetal deaths that occur a few days, or "before two weeks after the delivery," but to attribute those deaths to the operation per se is wrong and misleading. In deciding the method to be pursued it is also necessary to consider the maturity and vigor of the child, but these questions should be kept separate and distinct from risks to the mother and child from the methods of delivery themselves, if we are to arrive at correct conclusions. I take it that one would be justified in adding a very slight risk to the mother's chances by choosing a method which would entail no risk to the child, in preference to a method under which the child would have less than one chance in two of being born alive, and would add little or nothing to the mother's chance of recovery. It can be proved by the statistics at hand that no method of delivery gives the immature or weakly child so good a chance to live as does Cesarean section. In the 126 cases of Cesarean section collected by the writer and made use of in the first part of this paper, there were only 4 fetal deaths, and not one of them in the

[1] Journal of the American Medical Association, May 20, 1905.

remotest way due to the method of delivery. According to those same statistics, the maternal death rate in Cesarean section all told is 4 in 126 cases, or 3.17 per cent. One of those deaths was due to eclampsia and one to uremia, leaving 2 deaths in 126 cases, or 1.58 per cent. due to the operation. A death rate of less than one fourth of that given by Holmes for "obstetric" methods.

Macan, in his paper read before the *British Medical Association*[1] on "The Treatment of Accidental Hemorrhage," says that "from his personal experience he is entirely in favor of Cesarean section in these cases in preference to rapid dilatation of the cervix." "He would favor vaginal Cesarean section." In the discussion which followed the reading of this paper, Kerr, of Glasgow, and Byers expressed themselves as in favor of Cesarean section, while Galabain "thought that Cesarean section might in some cases increase shock to a fatal issue." Rupture of the uterus in subsequent pregnancies, adhesions, and hernia are remote results said to follow Cesarean section that must be considered if we are to arrive at correct conclusions.

Werth[2] has had one case of rupture of the uterus following Cesarean section and has collected eleven others. Prusman had one case occurring in a woman who had been delivered twice by Cesarean section.[3] He says that the mucosa had grown into the cicatrix. His patient was saved by operation. This author says that when his paper was written (1905) but 7 other cases had been recorded. In Davis' review of the literature of uterine rupture in *Progressive Medicine* for September, 1908, appear abstracts of articles from four reporters, giving their personal experience in 29 cases, and from a paper by another in which the statistics of 97 cases are given, and in no case is a previous Cesarean section given as a

[1] American Journal of the Medical Sciences, cxxiv, p. 360.

[2] Journal of the American Medical Association, September 16, 1905, abstract.

[3] Ibid., October 7, 1905, abstract.

cause for the rupture. Dr. Zinke (personal letter) has had one woman upon whom he did a Cesarean section who was subsequently successfully delivered with the aid of induced labor at the thirty-fourth week.

The writer has had one patient, a primipara four and a half months' pregnant, from whom he removed a large uterine fibroid which necessitated damage of the uterine wall down to the mucosa over an area larger than the palm of the hand, who delivered herself naturally at term of the child which she was carrying at the time of the operation, and has since been normally delivered twice.[1] He has also had another patient upon whom a Cesarean section had been done by him following the removal of an ovarian cyst, who has since been delivered without accident. It is well to recall just here that rapid dilatation is much more likely to produce rupture of the uterus in placenta previa than in cases of normal implantation, because of the increased friability of the uterine tissues at the placental site as compared with the tissues at a distance. Davis[2] has had one fatal case following the use of Bossi's dilator. Winter[3] reports 4 cases, 2 of which were fatal. In one spontaneous expulsion occurred after version, in one version and extraction was done, in one the child was expelled largely by abdominal pressure after version, and in the other five minutes were occupied in bringing the head through the cervix. Lea[4] reports a fatal case in which version and extraction of a seven months' fetus was done.

Considering the sparsity of cases of rupture of the uterus reported as following Cesarean section and myomectomy and the results of muscle suture in general, the conclusion seems warranted that the danger is so slight that it may be disregarded, save in cases of unusual obstruction to the passage of the child due to narrow pelvis, large child, or other cause, in which cases subsequent pregnancies should be prevented

[1] Annals of Gynecology and Pediatrics, February, 1902.
[2] Progressive Medicine, September, 1908, p. 193. [3] Loc. cit.
[4] American Journal of the Medical Sciences, cxxx, p. 360.

by removal of the tubes, or a Porro operation, or the woman should again be delivered by Cesarean section, as the exigencies of the case demand.

So far as concerns the question of adhesions it may be said that, because of the size of the uterus immediately following delivery, they are more likely to form between this organ and the abdominal wall than in any other operation save ventrosuspension or ventrofixation, but that troublesome adhesions are more likely to form after Cesarean than after other abdominal operations, there is no reason to believe. The accumulated experience of competent operators warrants the assertion that the danger of hernia is practically nil. That the danger of Cesarean section is not materially increased by some hours of labor in the absence of infection, I am convinced. That infection increases the danger of Cesarean section more than it increases the danger of obstetrical operations is not proved. Hirst (who has done 80 Cesarean sections with 5 deaths) in his letter says, "My recent experience convinces me that Cesarean sections may be done with impunity, after hours of labor, if the woman is not infected and the technique of the operation is as good as it ought to be; the mortality even in infected cases need not necessarily be excessively high."

We are warned by many writers that there is danger of having unnecessary Cesarean operations if we emphasize the lack of danger in favorable cases. This danger is a real one perhaps, but that it is as great as is that arising from the all too prevalent notion that high forceps, version, and other obstetric operations require no particular skill lacks proof.

The point I wish to make here is that the so-called obstetric operations require for their proper conduct just as much skill as does Cesarean section. Indeed, I am of the opinion that the inherent difficulties of the obstetric operations are greater than are those of Cesarean section. All the operations under consideration require skill and judgment, and it is little short of criminal for one who is not possessed of both to undertake any one of them.

The following conclusions are presented:

1. In patients with contracted pelvis, Cesarean section should supplant the obstetric operations in many cases and practically always in primipara.

2. In placenta previa centralis, Cesarean section should be the operation of choice if the child is viable.

3. In eclampsia occurring at or near term in a first pregnancy, Cesarean section is the best method of delivery except in cases where the child is relatively small, or the vagina and pelvis capacious, when Duhrssen's operation might be given the preference.

4. Women requiring abdominal section at term for the removal of uterine or ovarian tumors should be delivered by Cesarean section immediately before or after the tumor is removed.

5. Given an elderly primipara at term with a vigorous child, with a normal pelvis, but with rigid soft parts, who is unusually sensitive to pain, whose nervous equilibrium is unstable, and whose physical condition is below par, and Cesarean section done before labor has begun or at its very beginning offers a better chance of life and health to both mother and child than the so-called conservative operations.[1]

6. It is not to be forgotten, of course, that one of the chief arguments in favor of Cesarean section as against other operations is the fact that it entails no risk to the child, hence in case of a dead or dying child this argument carries no weight, and therefore it will not infrequently happen that because of a dead or dying child a conservative method will be better in a case in which, were the child vigorous and viable and the other conditions the same, Cesarean section would be the better method.

[1] In this connection I would like to refer the reader to Newell's paper in the October number of the American Journal of the Medical Sciences on "The Effect of Overcivilization on Maternity," and which was not published until this paper was well along. The class of patients referred to in conclusion (5) do not always belong to the "overcivilized" class.

DISCUSSION ON PAPERS OF DRS. SMYTHE AND PORTER.

Dr. E. Gustav Zinke, of Cincinnati.—I have been intensely interested in the cases reported and in the papers that have been read. If I were to offer any criticism of Dr. Smythe's paper, it would be to the effect that Cesarean section, especially a Porro operation, was unnecessary under the circumstances. It is, perhaps, improper to criticise a man for what he has done in a given case, and I do not want to have my criticism understood as a reflection on Dr. Symthe's ability or his judgment. As I understand him, there were no complications other than the presence of a large ovarian tumor on one side, and a very small one on the other side. The pelvis was a normal one. The large ovarian cyst was removed without difficulty, and the smaller one, judging from specimen shown, could have been removed at the same time, the abdomen closed, and the woman left to take care of the pregnancy herself. So much for Dr. Smythe's paper.

As to elective Cesarean section, Dr. Porter has presented the matter exactly as things stand at this moment in this country, in England and in Canada. I was of his opinion up to the beginning of the present year; but newer things have come to us (within recent years) which demand serious consideration. I refer to the recent work done by Gigli, Pinard, Zweifel, Doederlein, Bumm, Buerger, Kroenig, and many other European authorities on obstetrics. If what they say is true, and I have no reason to doubt it, Cesarean section will cease to be an elective operation, and will be performed only for positive indications. The "new therapy" of narrow pelvis, developed by these authors, has secured for them in a series of more than 2000 cases of labor complicated with narrow pelvis, 80 per cent. of spontaneous labor with living children and without injury to the mother; 15 per cent. of the cases were delivered with the aid of hebosteotomy, and only 5 per cent. required Cesarean section; all this with a maternal mortality of 0.1 per cent. If we compare the maternal as well as the fetal mortality of the new theory of narrow pelvis, namely the expectant method, hebosteotomy in moderately contracted pelvis, and Cesarean

section only for positive indications, with the present mortality of the conservative Cesarean section, and the so-called compromise operations (the induction of premature labor, prophylactic version and high forceps) we cannot fail to realize that a great forward step has been made in the practice of obstetrics. The collective mortality of prophylactic version, high forceps and the induction of premature labor in the best of hands, is still 4 per cent. for the mother, and from 60 per cent. to 70 per cent. for the infant. Compare this mortality with that of the new treatment of narrow pelvis. It seems to me there is nothing left for us to do other than to follow the precepts from abroad.

Dr. Henry T. Byford, of Chicago.—I am sorry that the gentleman who read the first paper (Dr. Smythe) did not bring forward a few statistics to substantiate the position he has taken. To generalize as he has done would seem to me hardly warranted. When we can operate before labor in elective cases, I have always thought that a Cesarean section is the simpler operation. Cutting down through the pelvic connective tissue involves certain risks, which, in the pregnant state, would cause us to hesitate, to say nothing about mutilating the mother.

With regard to placenta previa, I think with Dr. Zinke, that we should take note of recent improvement in obstetric practice. By ligating the uterine arteries we can avoid hemorrhage for a short time and gain time to deliver, per vaginam, or to do a vaginal Cesarean section.

Then, again, I think it rather radical to recommend Cesarean section in old primiparæ. There are exceptional cases, it is true, where this operation might be done as a last resort, but it ought not to be proposed in a general way as preferable.

Dr. Charles P. Noble, of Philadelphia.—Some of you may know that I went into gynecology through obstetrics and from gynecology into surgery, so that the obstetrical field is one in which I am interested. Fifteen years ago, when I was still doing obstetrics, I made up my mind that the field of Cesarean section should be very much broadened, and so far as that general spirit of the paper is concerned, I am heartily in sympathy with it. Now, the question is, which is the more dangerous to the mother, an elective Cesarean section, or a *very difficult forceps* labor? Which

is the more dangerous for the child? Surely, anyone who has had experience in obstetrics and who knows the extreme difficulty of deliveries, either by forceps or by version, in extreme cases in which these are applicable under the ordinary conditions existing in private practice, who can contrast that by what can be done by abdominal surgery under favorable conditions, must be driven to the conclusion even on *a priori* grounds, even though statistics did not prove it, that Cesarean section is much safer. We do not need to theorize because we have the facts, and if anyone will read the reported statistics of Dr. Reynolds, of Boston, and the group of men who worked with him on purely elective cases, he will find that the mortality to the mother approaches zero. In other words, it is practically no more dangerous or scarcely more dangerous to do an elective Cesarean section, that is, for the expert to do it, than it is to do an ovariotomy. Certainly 1 per cent. ought to cover the mortality. Therefore, so far as that aspect of the discussion is concerned, I am heartily in sympathy with broadening the field of Cesarean section, from the standpoint of the mother. How about the child? Everybody knows that by version a considerable percentage of the children are lost. It has been some time since I looked up the statistics, but my recollection is that at least one-third of them are lost. How about Cesarean section? About 100 per cent. are delivered alive. Take the ones that do not die, after severe, difficult forceps labors, then you have all the palsies, the injured brains, with the permanent bad results from pressure on the brain. Add them to the balance, and where do we arrive? First, it is safer for the mother, or equally safe, and second, it is infinitely safer for the child. In these days of low birth rate, expediency suggests that we consider the child. And then with regard to the question of right or wrong, I long ago made up my mind I would not kill any child; I never intend to, because I think it is just the same to kill a living child *in utero*, that can be delivered by Cesarean section, if the doctor does it deliberately, as to kill it after it is born. I think there is little difference.

To leave this question and take up some of the others, I have been much impressed by the work of Dr. Miller, of Pittsburg, in the preliminary ligation of the uterine arteries in dealing with placenta previa, and those of us who are

old enough to remember the papers of Lomar, Hofmeier, and Behm, which appeared about 1884, in which they reported a series of cases delivered by the Braxton-Hicks method with very favorable results, will realize that a good obstetrician can save almost all mothers when they have cases of placenta previa to deal with, and if in addition to the Braxton-Hicks method, we tie the uterine arteries, we certainly ought to do better than they did, and their mortality was very low; it was only 4 per cent. Surely by the Braxton-Hicks method we can obtain a very low mortality in placenta previa cases, and if in placenta previa centralis this treatment is applied at the proper time, that is, before the woman has almost bled to death, there will be practically no mortality, and by doing preliminary ligation of the uterine arteries, even in cases of placenta previa centralis, the mortality should be low; so that in my judgment the field of Cesarean section for this particular condition is very limited, and it should only be considered in the cases of old primiparæ or in cases in which there is a contracted pelvis in addition to the placenta previa, and in cases of central implantation.

With reference to the point discussed by Dr. Byford, namely, the performing of a Porro operation in conjunction with an ovariotomy in a pregnant patient, it seems to me that if any operative delivery were indicated, a classical Cesarean section would meet all the indications, because it is surely safer than a Porro, and then it leaves the woman with her pelvic organs intact. What is the fetal mortality by the Braxton-Hicks method? There we have an argument, in favor of Cesarean section, because the fetal mortality is relatively high, but it is not very high provided the treatment is instituted early, and, that is, correct treatment, not to wait until the patient has bled to death, and the fetus has almost bled to death, and the fetus is almost necessarily dead before treatment is instituted. If the method is instituted at the proper time, it will materially cut down the fetal mortality.

Dr. Maurice H. Richardson, of Boston.—I do not think that this discussion ought to be closed without our having a little more talk on the subject of the paper read by Dr. Smythe. I have had no experience in obstetrics since the earliest part of my practice; but, in common with most

abdominal surgeons, I have had a great deal to do with the complications of pregnancy, and with the diagnosis of pregnancy, especially in connection with abdominal tumors. This is a very important part of my work.

I have called in consultation to see patients with tumors of the uterus, and with other abdominal tumors, for the purpose of removing them in order that pregnancy might go on and labor take place normally; but I want to say, that unless these tumors interfere seriously with n rmal confinement, the results from non-interference are in my own experience very good indeed. One of the first things I learned was—and I hope that other surgeons will give their experience along this line—that Nature is very kind in the delivery of a child from the uterus which contains fibroids. Recently a patient was sent to me with a large uterine fibroid which seemed to be so situated as seriously to interfere with confinement. I examined the woman repeatedly, and sent her to the hospital about the time of approaching confinement, as there was no doubt in the mind of anyone that this tumor would seriously obstruct delivery. Before the patient could get to the hospital she had a normal confinement, and two or three weeks thereafter I could not feel any tumor! I later found a small fibroid in the fundus.

Another patient was sent to me for a Porro operation. There was deeply adherent in the pelvis a tumor which proved to be a fibroid, with a small pedicle. The tumor was removed at about the time of quickening, and the operation was followed by complete recovery. The woman has not yet been confined.

I remember very well my first complicated case. I think that Dr. Edward Reynolds was then my hospital assistant. A double ovarian tumor was diagnosticated, as there were two large tumors—one on the left and one on the right side. I removed the right-sided tumor, and then, with a Spencer-Wells trocar, tried to tap the other cyst. The trocar would not penetrate the tumor, even by vigorous effort. I then found, to my horror, that we had to deal with a pregnant uterus. The woman lived, and with the assistance of Dr. Reynolds, the baby was born at the proper time. No harm whatsoever was done.

It seems to me that it is of some value to know, from

the collective experiences of members, what the pregnant uterus is capable of standing. It does not follow that we must operate by Cesarean section, or that the removal of the obstructing tumor will necessarily interfere with the child. The number of cases is naturally small in my own experience; but I recall a number of them. Every one I have had has done well, and the child has been born at term. I am happy to say that there has been no bad result in this class of work in my experience.

One other thing apropos of this brief discussion is, that septic conditions in the pregnant uterus are dangerous, and oftentimes fatal. For instance, acute appendicitis complicated with a pregnant uterus, after fetal movements can be felt, has been unusually fatal. Therefore, on slight suspicion I have removed the appendix, before it has become perforated or gangrenous. That has been the rule with me.

I do not want to get off the subject, but it seems to me that we ought to hear some of the experiences of the Fellows in connection with the tumors which seriously complicate childbirth; and, though my experience has been wholly favorable, it has been too small to enable me to draw any general conclusions. So far as it has gone, however, it encourages us to attempt in favorable cases the enucleation of tumors that interfere with the normal course of pregnancy.

Dr. Charles H. Mayo, of Rochester, Minn.—The point just made by Dr. Richardson is interesting, that is, to control our surgical enthusiasm after we have laid down a plan of action and do not find it necessary to go on with it. It is an important thing many times, when a surgeon is very much confused in finding something different from what he had planned, not to insist on going ahead in accordance with what he had previously planned to do, and in this connection I wish to report briefly two cases in which an incision had been made and an elective operation planned in the nature of a Cesarean section at the latter end of pregnancy, in which a large tumor occupied the pelvis, and it seemed as if it was absolutely necessary to go ahead, yet with a little manipulation, the tumor was lifted out of the pelvis, and pregnancy allowed to go on, and in these two cases the women went on to perfectly normal delivery. Nature is very kind in these cases. I know of one case in which the woman was four and a half months advanced in preg-

nancy, yet a tumor larger than the uterus was removed from the uterus without interfering with pregnancy. We have had at least twelve such cases, and I recall that we have removed fibroids from the pregnant uterus, and in none of them has there been a miscarriage. They have all gone on to the time for delivery. In one of them we watched and planned because the woman had a large tumor filling the pelvis. She was kept near the hospital, with a view of being brought in when the elective time came, but fortunately this tumor rotated out of the pelvis and the woman went on and was normally delivered, and insisted on keeping her uterus.

Dr. Rufus B. Hall, of Cincinnati.—The remarks of the last speaker induce me to discuss this subject a little, and perhaps I can better do so by referring to some work of my own.

I recall one woman who was about four months pregnant. She was thirty years of age, and the mother of one child. She came to me, and, on examination, I found there was a tumor in her pelvis about the size of a fetal head, the pregnant uterus being in front of the tumor. This tumor could not be pushed out of the pelvis. I advised operation, and was cautious to say what the operation would be, possibly a hysterectomy. At the time of the operation this tumor proved to be a dermoid. It was so adherent that it was difficult to remove it. Considerable damage was done to the pelvic peritoneum, and to the peritoneum on one side of the uterus. The other ovary was in a cystic condition, requiring removal. The question arose in my mind whether or not to do a hysterectomy or leave the woman to be delivered by miscarriage or go on to term. To my surprise, the patient recovered without having a miscarriage, and was delivered in the course of due time of a living child.

Another case that has come under my observation in the past few months is of interest as bearing upon this subject, and of how much nature will stand. The woman was forty years of age, pregnant, and about to be delivered. She came to me with some acute trouble in her abdomen, with considerable fluid in it, perhaps a gallon or two. She had been sick two days. I operated on the same day she was sent in. I found an ovarian tumor about the size of a cocoanut, with a twisted pedicle, with a gallon or two of fluid

in her abdomen. I removed the tumor, did not interfere with pregnancy, and she recovered nicely. On the thirteenth day following the operation, a nurse telephoned me that the patient was in labor. My office is about three miles from the hospital, and I told the nurse I would come as soon as possible. I did not hurry, however, although I was there in about thirty minutes. On my arrival at the hospital, I found that the nurse had delivered the woman, dressed the child, and the placenta delivered itself. The patient made a nice, smooth convalescence, and went home in the usual time.

Dr. Charles L. Bonifield, of Cincinnati.—There are only one or two remarks I want to make on this subject. First, in regard to Dr. Smythe's paper. I would like to have him explain in closing the discussion—and I have no doubt he has an excellent explanation to offer—why he regarded it necessary to empty the uterus, because the abdomen was opened? I notice Dr. Porter said the same thing in his final conclusions, namely, in operating at term, if the abdomen is open, remove the ovarian cyst or fibroid tumor, and open the uterus and extract the child. Personally, that does not appeal to me. I like to do surgery; that is the way I make my living. On the other hand, I do not believe I can improve on Nature, and I believe the good Lord intended that most children should be born through the vagina, and that we at least give the uterus a chance, and if there is no special reason for it, these women should have been allowed to go on and be delivered in the normal way, particularly the case of Dr. Smythe. But I have no doubt Dr. Smythe, in his final remarks, will tell us all about it.

As to the difference between a Porro operation, and Cesarean section, I cannot quite agree with the Doctor. My experience in these operations is limited. I have never done but one Cesarean section myself, but I had the pleasure of assisting Dr. Zinke in doing one. In both instances I was struck with the exceeding ease of the operation. It is one of the simplest operations in abdominal surgery, and in healthy women I would not expect a mortality of more than 1 per cent. Of course, when the uterus is infected, a Porro operation is preferable, but when it is healthy, I see no reason for resorting to a Porro instead of ordinary Cesarean section.

Dr. William D. Haggard, of Nashville.—There is one conclusion Dr. Porter arrived at, with which we can heartily agree, and that is the wisdom of employing elective Cesarean section in cases of eclampsia who are at term, but not in labor. I have had occasion to do this operation twice in the last year in women of this class, who had been having a number of convulsions, one for eight hours, and the other nearly two days. Both were in a comatose condition. Both were delivered by Cesarean section in a comparatively short time, and both mothers and both children are living. I am satisfied that under any other method of treatment we might have instituted in these cases, our success would not have been as signal, and I feel that that particular conclusion is eminently jusifiable.

Dr. Walter C. G. Kirchner, of St. Louis, Mo.—By relating briefly three cases, some of these points mentioned may be brought out, particularly in regard to the kindness with which Nature handles these cases.

In a certain instance in which the pregnancy was complicated by a cyst, the cyst was removed, and the patient recovered from this operation. A few months later she developed a perforative appendicitis, was operated on for this condition, recovered from the operation, and was delivered subsequently of a healthy child.

In emergency work we are obliged to resort occasionally to Cesarean section, especially in gun-shot cases, where there is injury to the abdomen and the patient is pregnant. I have had one such case, where the patient tried to commit suicide by shooting herself in the abdomen, and intending to kill the child. In this instance the uterus was perforated, the child uninjured, Cesarean section was performed, the child extracted, and is alive. The child was nearly full term. Later the patient died of general peritonitis.

Quite recently I had a very interesting condition in which apparently the indications for Cesarean section were present. The case was an emergency one. The patient had had eight children. On examination, a pronounced but old laceration of the perineum was found; the cervix was markedly edematous and prolapsed. The physician who examined this woman under an anesthetic found that normal delivery was hardly possible. The fetal heart sounds were heard distinctly. The abdomen was not symmetrical, and there were indica-

tions of serious trouble. The history was that of a woman at full term with a viable child. The patient's condition was getting worse, and section was decided on. On opening the abdomen the condition resembled multiple cysts. There were many intestinal and omental adhesions, and it looked as if we were dealing with a large cyst. This mass contained the fetus. If we can imagine a large cyst of the right ovary containing the conditions that are present usually in the uterus, the placenta, and fetal membranes, we will realize what we had to encounter in this instance. The cyst was opened, the fetal membranes were ruptured, and this sac contained amniotic fluid and the child. The child was easily resuscitated, and is now in a healthy condition. The operation was done about three weeks or more ago, and the mother is convalescent. From our observation, it seems that this was an ovarian pregnancy which had gone on to full term, and, as I have said, the mother and child are in good condition.

Dr. M. C. McGannon, of Nashville.—My only excuse for saying a few words before this discussion is closed, is the importance of the subject. The results of such observations as may come from a discussion of this character, must be impressed upon general practitioners, because the consequences of operating or not operating in these difficult cases must rest with them; hence it is proper that we should so treat this subject that our opinions may reflect upon general practitioners throughout the country and educate them in the proper lines to be pursued in these cases.

I am quite in accord with the broadening principles in connection with Cesarean section, for the reason that it is probably one of the simplest operations, in the hands of an expert, with which we have to do inside of the abdomen. The mortality rate, as has been well pointed out, is practically *nil*. It is very small indeed when the operation is done by a competent man under fairly decent circumstances. It is practically *nil* so far as the mortality to the mother is concerned. The morbidity has not been reported as yet. It gives the child under all circumstances the best chance for its life. The morbidity to the child, as has been pointed out, has been very much less under delivery by Cesarean section than in any other way.

I want to add a report of two or three cases that have

recently come under my observation, to show the necessity of educating general practitioners, who are in a position to determine what shall be done in these cases, and to show you it is our duty to undertake this operation.

I saw a case within the last year of placenta previa centralis in a young woman. It was her first pregnancy, and the bleeding occurred during the last month of pregnancy. She had an extremely narrow vagina. There had been no attempt at dilatation of the cervix uteri. I saw the case in consultation, and advised Cesarean section. I am sorry to say, I was not sufficiently persuasive in my arguments to induce either of the consultants—three of them—to agree with me in that position. The matter was laid before the family, and Cesarean section was pointed out by the gentlemen as being, in their opinions, more serious than I considered it, and so the family decided that delivery be effected, if possible, in the normal way. One gentleman expressed himself as being quite sure he could deliver the woman safely. I told him I thought the child would be dead when delivery was completed, and the mother also, and that I could not be a party to a delivery of that kind; that it meant death of the child, and the child had practically as good a right to live as the mother. Delivery was effected, and within a few hours thereafter I saw the physician who delivered her. He was driving along the street; I stopped him, and asked him whether he had delivered the woman, and he replied, "Yes, I accomplished it." I asked, "How about the child?" "It is dead?" "And the mother?" "She is dead, too."

Another case I saw was one of eclampsia. In this particular instance the woman was in the eighth month, within two weeks of her time. She had been having eclamptic seizures for a week; they were kept under control fairly well by the physician who had the patient in charge. She was thirty miles from my city. I was called to see her in the morning. She was then comatose, and had been so for some six or eight hours before I arrived, with pulse of 160, and practically in a moribund condition. Cesarean section was done immediately, with the result that a good strong, lusty child was delivered. The mother, however, never regained consciousness. She died within a few hours after the delivery. There was no particular difficulty in connection with the operation. It was accomplished as easily as one

accomplishes Cesarean section under ordinary circumstances; it was over in twenty minutes. While we saved the child, the chance of saving the mother's life had long since gone by, and if the gentleman who had the case in charge had been educated along broad principles, such as we have been talking about, I feel satisfied the mother, too, would now be living.

I saw another case within the last three days, which to some extent, exemplifies the same position. A young woman, this being her first child, was taken in labor. The physician, who had the case in charge, upon examination found the chin was presenting. For twenty-four hours he labored unceasingly to right that position and deliver the child. He was unable to do so, and I was asked to see the case with him. This was a woman with a narrow pelvis. At the time I saw her the cervix was well dilated and the vagina soft, but the child was then dead. I succeeded in righting the position and delivered the woman with instruments. As I said this case occurred within the last two or three days, and what the condition now is, I do not know. The morbidity will probably be serious. In that particular instance, too, if the physician had been educated to the fact that with such a difficult case in a primipara, after fair attempts at delivery of the child had been made and were unsuccessful, the child's chances would have been better with Cesarean section, and the mother's chances just as good. As it is, the child is dead in this particular case, and the mother's chances of morbidity are very great.

I want to say that in all of these cases described by Dr. Porter, there is a middle ground that is safe and true, and that it depends largely upon the judgment of the man in charge at the time, as to what shall be done, but in the great majority of these cases Cesarean section should be the procedure adopted.

Dr. Smythe, of Memphis, Tenn. (closing the discussion on this part).—I felt satisfied that my position would provoke considerable discussion notwithstanding the opposition to my position, which was quite positive on the part of some participating in the discussion.

As to Dr. Porter's position on the subject of Cesarean section, will say that it is in accord with the most recent literature on the subject, and is in my judgment well taken.

The course suggested by the Doctor is the one that would be pursued by a competent and conservative surgeon when confronted with a case justifying the operation.

My case was not discussed except by a few of the gentlemen who discussed the subject of Cesarean section, as an operation of election. The case reported and operation performed, was a life-saving procedure to both mother and child, and I feel sure that had the first gentleman discussing the paper been present on that occasion he would not have considered for a moment the possibility of the mother going to full term and being delivered normally.

The duty of the surgeon is to the patient at hand, as I stated in my paper, and only after the most rational measures have been resorted to for the purpose of saving the patient in his charge is he justified in resorting to measures that would increase the hazard to the patient. There is no man within the sound of my voice who would entertain a very high regard for the surgeon who would deliberately leave a woman in a condition that would necessitate labor coming on at a time when her resources were already exhausted.

This patient had a pulse 160, abdominal walls as thin as a sheet, the tumor elevating the chest, there was edema, with albumen and casts in the urine, and operation other than delivery in the normal manner was positively indicated, in fact, imperatively demanded.

With the remarks made regarding the question as to when is the best time for operation, by the speaker, I am in accord when it comes to the operation of election, but the question that I had to decide, was the saving of two lives, and I adopted the course that appealed to me as being the most rational under the existing circumstances.

As to the preference between a Porro and Saenger, it is one that we could consider in many cases but the Porro operation appealed to me on that occasion as best suited to the conditions. I have already given my reasons why the Cesarean operation was advisable. It was not a question of choosing between one or two procedures. The child's life in this case was saved by the operation just as certainly as if a cripple had been rescued from a burning building.

I appreciate having heard the literature discussed on the subject of Cesarean section in general but regret that the case I have reported was somewhat overlooked.

Dr. Porter (closing).—There are many things in my paper that I did not read, but which you will see brought out when it is published; one concerning craniotomy. I said in my paper that craniotomy, in my opinion, on a living, viable child, unless it be a monster, is an entirely indefensible procedure, the opinions of Pfannenstiel and others to the contrary, notwithstanding.

It should be borne in mind that the figures given by Dr. Zinke apply to cases of contracted pelvis, and have nothing whatever to do with the other indications mentioned in my paper for Cesarean section, and if the procedure which the Doctor and his German friends advocate can show a mortality of less than 1 per cent., or 1 per cent., or less, for the mother, a mortality of zero for the child, and a morbidity rate less than that which attends the average labor, then I will abandon my position and take theirs gladly; but they will have to do it by showing, first, that pubic section can be done with a mortality rate of 1 per cent., with a morbidity that is exceedingly below the average morbidity of what we are pleased to term normal labor.

So far as the statistics given by Dr. Noble are concerned, if my recollection serves me right, he is quite correct in the 4 per cent. mortality, so far as concerns the mother, but have I a right to submit those children to an operation that will entail a mortality of over 30 per cent., for the sake of saving 4 per cent. of the mothers, when I can deliver them by Cesarean section with absolutely no mortality to the child, and with less than 4 per cent. mortality to the mothers? I think not.

Concerning the question of tumors, my position is this: that if I open a woman's belly for the removal of a large tumor at term, I can remove the child through an incision in the uterus with less risk in every way to the mother and child than I can deliver her through the natural channel. Therefore, I should not hesitate to do so. I have removed an eight-pound tumor from the fundus of the uterus, going down to the mucous membrane, the woman being four and a half months pregnant, secured firm union thereafter, and delivery of a normal child. Women whose bellies are already opened for the removal of large tumors can be delivered through an incision in the uterus with less risk than delivery could be effected in the natural way.

Another question not infrequently brought up is, "What are you going to do when you operate?" My position is simply this, and I state it to the patient or family: "I shall do whatever, in my judgment, is correct; if you will not let me operate under those circumstances, I will not operate at all." If we operated with that understanding, I am sure we would have a minimum amount of trouble thereafter, so far as complaints are concerned.

DR. NOBLE.—Granted that an expert operator can get 1 per cent. mortality under Cesarean section, and patients are operated on all over the country where an expert is not always available, in placenta previa what is the family doctor to do?

DR. PORTER.—I am glad you asked that question. I have answered it in my paper. I wish to make this remark in this connection, that obstetric operations require for their proper conduct just as much skill as does Cesarean section. I am of the opinion that the inherent difficulties of obstetric procedures, so-called, are greater than those of Cesarean section. All of the operations under consideration, whether Cesarean section or the ordinary obstetric operation, require skill and judgment, and it is little short of criminal for one who is not possessed of both, to undertake either. The notion that the average practitioner can deliver a woman through the natural channel is one of the things that has resulted in an immense harvest of death and morbidity, and that brings me to another point, that a good deal of it is excusable on the ground, as Dr. Bonnifield, from Cincinnati, said, that it is the Lord's way of delivering children. I do not pretend to know much about what the Lord intended, but I venture to assert that if he intends that a child shall be born through the vagina, he would not insist on the child being born through the vagina simply for the purpose of maintaining that position, if the birth of the child that way is to result in the sacrifice of the lives of both mother and child. I am not so much interested in what the Lord intends as to the route children shall travel in getting here as I am that when they get here they shall do so possessed of full bodily health, leaving the mothers in as good a condition of health as possible after being delivered of their children.

APPENDICOSTOMY IN PERNICIOUS ANEMIA.

By L. E. Burch. M.D.,
Nashville, Tennessee.

It is with some hesitancy that I bring before this distinguished surgical body a subject that has always been considered a medical disease, yet as the results obtained by surgery in the case to be reported are rather remarkable, I trust that the subject will be of some interest.

Pernicious anemia is a primary anemia, charcaterized by a progressive diminution in the number of red blood corpuscles and changes in their form, associated with a decrease in the amount of hemoglobin, which is not so marked as the reduction in red blood cells. The disease usually terminates fatally, whatever the method of treatment, but often there are periods of marked improvement, followed by relapse. It is not within the province of this paper to discuss the etiology, pathology, or symptoms of this disease, but to limit myself to the treatment of those cases that are supposedly due to anërobic bacteria in the intestinal tract. Herter, who is the pioneer in this line of work, claims that anërobic bacteria in the intestinal tract play a prominent part in the etiology of pernicious anemia. He has shown that oxygen is only found in the small intestines, and for this reason these bacteria must live and propagate in the large gut. He has demonstrated that these bacteria form a toxin, and by injecting this toxin in the lower animals, a blood picture similar to pernicious anemia is produced. With this theory as a working basis, Hollis and Ditman have used colonic lavage in two cases with good

results. In both cases arsenic was thoroughly tried, without beneficial effect. The colonic lavage caused the indican and the skatol to rapidly disappear from the urine, and the hemoglobin in two months' time rose from 25 per cent. to 80 per cent. and the red blood cells from one million to four million. Several months after discharge both patients were well, and with no decrease in blood count.

Houghton, in the *Journal of the American Medical Association*, June 29, 1907, reports a case in which the treatment was more radical. The patient was a male, aged sixty-nine years, with symptons and physical signs of pernicious anemia; hemoglobin, 45 per cent. Unfortunately, the reds were not taken. A differential showed a relative lymphocytosis with many normoblasts. Urine was albuminous and contained casts, and the skatol and indican reaction was marked. Arsenic and colonic lavage failed to produce any improvement. He performed a cecostony, and through the fistula the colon was irrigated night and morning with a saline solution. The patient improved rapidly, but Houghton informs me, in a personal letter, that he died twenty months after operation from the kidney complication. A count made a short time before death showed the blood almost normal in character, with the exception of a slight anemia.

The case that I desire to report occurred in the service of my colleague, Dr. J. A. Witherspoon, and was under the charge of his associate, Dr. W. C. Dixon. The patient, a negro man, aged forty-five years, was admitted to the hospital the first week in April, 1908. He had marked muscular weakness, shortness of breath, and instability of the pulse, also edema of the ankles. He came to the hospital for relief from diarrhea, associated with gastro-intestinal symptoms. His mucous membranes were quite pale, there was brownish discolorations on the skin of hands and face, exhaustion extreme, without marked emaciation. An examination of blood on April 10, showed the red blood cells 1,800,000, the white blood cells 3000, hemoglobin 30 per cent. He was

given ascending doses of arsenic, reaching as high as 30 drops three times a day of Fowler's solution. Colonic irrigations of salt solutions were also used. On May 5, 1908, the red blood cells, were 2,000,000; white blood cells, 5000; and hemoglobin, 50 per cent. On May 23, 1908, red blood cells were 1,710,000; white blood cells, 3500; and hemoglobin, 50 per cent. The nucleated red cells were in great numbers, both normoblasts and megaloblasts, associated with a marked poikilocytosis. At this time 95 per cent. of the bacteriæ in the stools were anaërobic, and no intestinal parasites were found. A twenty-four-hour specimen of the urine showed a trace of albumen, no sugar, and a few hyaline and granular casts. The ethereal sulphates were present in large quantities in the urine as well as indican and skatol. A test meal showed complete absence of hydrochloric acid, with the presence of lactic. I suggested to Drs. Witherspoon and Dixon that an appendicostomy be performed, and by this means carry out colonic irrigation. As the patient had grown progressively worse under the routine treatment for this disease, and as his condition was extreme, they readily agreed, and with the patient's consent, the operation was carried out on May 23. I made a long incision through the right rectus muscle, in order that a good view of the abdomen might be obtained. The tissues showed but little tendency to bleed, the rectus muscle was quite red, while the peritoneum and intra-abdominal contents were unusually pale. The liver was slightly enlarged, and gall bladder moderately distended without stones. The stomach was markedly contracted, no growth being present. The meso-appendix was ligated and divided, two chromic-gut sutures were placed, one above and one below the appendix, grasping the cecum, peritoneum, and fascia. The appendix was then stitched to lower angle of skin surface of wound by one suture, and incision closed in ordinary way. The free end of appendix, beyond skin surface, was wrapped in rubber protective tissues and wound dressed. At the end of thirty-six hours tip of appendix was gangrenous and cut off. A small

rubber catheter was passed into gut through appendix and tied in position. Through this catheter a quart of saline has been passed into intestine twice daily from time of operation to present date. The fluid is usually passed out of anus in from one to five minutes from time of introduction into gut. The patient was delirious for one week following operation, and developed a multiple neuritis, which I believe, was due either to the disease or to the large doses of arsenic prior to the operative procedure. Ten days after operation improvement was noted in the blood, the red blood cells being 2,600,000; hemoglobin, 51 per cent. His convalescence has been slow but encouraging. The wrist and foot drop are now very slight, the appetite and digestion are good, and his weakness and exhaustion have disappeared. Up to October 10, the stomach contents showed complete absence of hydrochloric acid, on that date, however, an examination showed a trace of hydrochloric acid and the disappearance of the lactic. December 10, 1908, showed red blood cells 3,860,000; white blood cells, 7200; and hemoglobin, 60 per cent. It is interesting to note that before operation 95 per cent. of the bacteria in the stools were anërobic, the Bacillus capsulatus ærogenes preponderating. Ten days after 40 per cent. were anërobic; thirty days after 20 per cent. were anerobic; and on October 10 they were present only in normal quantities, and have remained so up to the present time. The large amount of ethereal sulphates, indican, and skatol found in urine before operation, and which is characteristic of pernicious anemia, are now only in normal quantities. A twenty-four-hour specimen showed no albumin or sugar, a few hyaline casts and urea $1\frac{1}{2}$ per cent.

I must express my thanks to my colleague, Dr. Wm. Litterer, for the careful examinations of the blood, urine, stools, and stomach contents, for without these, this paper would be of no scientific value, and to Drs. Witherspoon and Dixon, I am especially grateful for the very accurate history of the case. It is too early, at the present time, seven months

after operation, to claim a cure, yet the great improvement in the blood, the return of strength, the disappearance of the anërobic bacteriæ from the stools, combined with the reappearance of hydrochloric acid in the stomach, make a clinical picture which is very suggestive of recovery. It seems to me that we are safe, at the present time, in drawing the following conclusions in regard to pernicious anemia.

1. All cases should have stools examined, in order to determine the presence of a Bacillus capsulatus aërogenes infection.

2. If these bacteria are present in great quantities, then high irrigation, combined with arsenic internally, should be used, and if the patient fails to improve, then it seems to me that the appendix offers the best route for thorough irrigation.

DISCUSSION.

Dr. H. S. MacLean, of Richmond, Va.—About twenty months ago I operated on a case similar to the one that has been reported by the essayist. The man had been ill for years. He was brought to me with an attack of acute appendicitis, and in getting his history, before the operation, I was told of his anemia, and also of his continued weakness and bowel trouble. He had catarrhal appendicitis and I performed appendicostomy. He had been living on zwieback, buttermilk, etc., for years. Six weeks after the operation his red blood count was something over 4,000,000 and he went to Europe. He wrote me on the way over, saying that he was able to eat sauer kraut and the various German dishes which they serve on the North German Lloyd steamers. He has gained fifteen pounds and is in excellent health. The only feature about the case at present is that I cannot persuade him to allow the opening to close. He has gotten fond of it (laughter), and he likes to wash it out every few days in order to be sure that he keeps well.

THE QUESTION OF THE NECESSITY OF A SECOND OPERATION FOR THE REMOVAL OF THE APPENDIX IN CASES WHERE AN APPENDICEAL ABSCESS HAS BEEN TREATED BY SIMPLE INCISION AND DRAINAGE.

By Stuart McGuire, M.D.,
Richmond, Virginia.

In November, 1907, I read a paper before the Medical Society of Virginia, entitled "An Analysis of the Last 500 Cases of Appendicitis Operated on at St. Luke's Hospital." In this list of cases there were 93 appendiceal abscesses. In 70 cases the abscesses were not adherent to the abdominal wall, but were between the folds of the bowel and omentum, in a position they could only be reached after opening the general peritoneal cavity. In all these cases the adhesions were separated, the pus sponged out, and the appendix sought for and removed. In 23 cases the abscesses were adherent to the parietal peritoneum, and they were simply incised and drained. In speaking of this last group of cases I said:

"If an abscess is adherent to the parietal peritoneum, it should simply be opened and drained, and no effort made to locate or remove the diseased appendix. With all due deference to those who do not agree with me, I consider it a surgical crime to break up the protecting wall formed by nature, and to liberate infectious fluid into the peritoneal cavity, when a safe exit may be given the pus by simply following the indications of nature, and making an incision at the point where

she is endeavoring to effect drainage. . . . The safety of the plan advocated is shown by the fact, that of the 23 cases reported, there were no deaths. In every instance the patients were told that the operation was not for appendicitis, but for an abscess which was the result of appendicitis, and that the appendix had not been removed. They were warned of the possibility of future trouble, and were advised to apply promptly for surgical relief, if, in future, they suffered from abdominal pain."

The views expressed in the foregoing paragraph caused considerable discussion on, (*a*) the advisability of leaving the appendix at the first operation; and, (*b*) the necessity for its removal by a second operation. I will not, in this paper, take up the first question, as I believe it is pretty well settled, but I will devote the time at my disposal to a consideration of the second, as there seems to be a difference of opinion as to whether a secondary operation ought to be done in every case as a routine measure, or confined to the few cases where it is plainly necessary owing to recurrence of symptoms.

To reach conclusions, I have pursued two methods of investigation: (1) I have written to a number of surgeons to inquire the rule they follow; and, (2) I have written to the twenty-three patients whose cases I reported, to ascertain their subsequent history. The following are the replies received from the surgeons. A few did not answer my question definitely, probably due to the fact that it was not worded explicitly. Some have answered at such length that their opinion has to be given in abridged form.

Dr. Dudley P. Allen, of Cleveland, writes that he has simply drained in a large number of cases of appendicular abscess, and in the majority of them the cure has been permanent. It is not his habit to make a secondary operation unless there is a recurrence of symptoms. He cannot say definitely what percentage requires a secondary operation, but it is certainly very small.

Dr. Arthur D. Bevan, of Chicago, writes that in many

cases he has found it necessary to do a second operation to remove the appendix, where the primary operation was that of draining an abscess. This has occurred so frequently, (in perhaps 50 per cent. of his cases), that he now advises all patients upon whom he operates to drain an abscess, to have the appendix removed at a second operation.

Dr. Herman Bolt, of New York, apparently does not advise an operation unless called for by symptoms. He writes: "It is my opinion that, if an appendix does not undergo atrophic changes after an appendiceal abscess, so that it becomes innocuous, it is likely to cause symptoms at a subsequent time. At the first evidence of appendicular inflammation showing that the appendix is still inflamed, it should be removed."

Dr. G. E. Brewer, of New York, writes he does not fail to remove the appendix in over 2 per cent. of his operations. In these cases he advises its removal at a later period. He has seen a number of cases, however, in which the patient has had no trouble.

Dr. Joseph D. Bryant, of New York, writes that he is disposed to believe that the causes of abscess should be removed in all instances when practicable.

Dr. George W. Crile, of Cleveland, writes that in cases of acute appendicitis, with abscess, when he does not remove the appendix at the time, he gives the patient to understand that the operation will be done in two stages. After the wound of the first operation is healed, he operates a second time, removing the appendix and suturing in layers to prevent hernia.

Dr. Daniel N. Eisendrath, of Chicago, believes that it is a safer plan, whenever possible, to search for and remove the appendix at the primary operation, unless this involves the breaking down of important lesions. When the appendix is not removed, he does not believe there will be subsequent trouble in more than 1 per cent. of cases.

Dr. Ellsworth Elliot, Jr., of New York, advises a secondary

operation for the removal of the appendix, if symptoms of subsequent trouble develop after primary evacuation of an abscess. He believes, if the primary operation is not done early, the appendix is eventually a slough, in many cases, coming away with the evacuation of the pus, or subsequently in the discharge, and gives no further trouble.

Dr. John F. Erdmann, of New York, writes that when, on account of the precarious condition of the patient, he fails to remove the appendix, he advises a second operation within a relatively short time, and if they refuse to submit to it, he tries to impress them with the necessity of watching for trouble.

Dr. J. M. T. Finney, of Baltimore, writes that in cases of abscess treated by simple incision and drainage, he earnestly advises a secondary operation for the removal of the appendix. He was forced to this opinion by seeing three cases of death during secondary attacks of appendicitis, after an appendiceal abscess had been drained and the appendix left in.

Dr. John H. Gibbon, of Philadelphia, writes that he rarely fails to remove the appendix. At the same time, he thinks it a mistake to lay down a rule in regard to the subject, for what would be a good rule for one operator would be a bad one for another. If the appendix has been left in, he thinks it advisable to remove it later.

Dr. W. D. Haggard, Nashville, states that out of 21 ancient appendiceal abscesses (ten days' to four weeks' standing) most of which were adherent to the parieties. They were all opened and drained without searching for and removing the appendix. He has had to reoperate but four times; in a girl of eight, the abscess recurred and was drained three times before removal. In an elderly man, a sinus persisted for fourteen weeks and when the appendix was removed contained a cherry-stone-sized enterolith. The third, in a man, aged thirty-six years, had two recurrent attacks and when removed the appendix was adherent by its tip to the abdominal wall at

the site of the drainage aperture. The fourth, in a woman, aged twenty-nine years, continued to give trouble; tenderness and soreness with some disability, and was found adherent and subacutely inflamed eight months after the first operation. The others were advised to have a secondary operation, but they all deferred it, with the promise to have it removed if they had further trouble. Where the abscess is not adherent to the abdominal wall, the appendix should be removed.

Dr. R. H. Hart, of Philadelphia, thinks that an appendiceal abscess should be simply opened and drained, for if a persistent attempt is made to remove the appendix, there are apt to be disastrous results. If the appendix subsequently gives trouble, it should be removed by a secondary operation.

Dr. George Ben Johnston, of Richmond, Va., states that it is his practice to open appendiceal abscesses, drain them, and not attempt to remove the appendix in the presence of pus. In his experience, hernia usually follows, and he invariably advises a secondary operation for the removal of the damaged appendix and the repair of the hernia, if it exists.

Dr. Howard Lilienthal, of New York, apparently does not advise a secondary operation unless symptoms develop. He writes: "When sinuses or fistulæ persist, incise the tract and remove the appendix or its remnant. When there are persistent symptoms pointing to appendicitis following healing of a drained abscess, perform secondary appendectomy."

Dr. W. J. Mayo, of Rochester, Minn., writes that, as far as possible, he recommends and practises the removal of the appendix at the time of the primary operation. When, for any reason, this is not done, he advises a secondary operation in all cases, as he believes that 25 per cent. or more of patients will suffer serious symptoms if the appendix is not removed.

Dr. Edward Martin, of Philadelphia, writes that he has so habitually taken out the appendix for all conditions, that he has had no personal experience in the removal of the organ at a secondary operation.

Dr. E. Denegre Martin, of New Orleans, writes that he has

always contended that just so long as a diseased appendix remains in the abdominal cavity, it is a menace to life and liable to explode when least expected, and often when most inconvenient. His personal experience has been such as to emphasize the importance of a secondary operation in every instance.

Dr. Rudolph Matas, of New Orleans, writes that he is convinced that if an appendix has been sufficiently damaged to cause an abscess requiring drainage, that sooner or later it will cause a repetition of suppuration. As a general rule, he advises a secondary operation to protect the patient from future trouble, but in a few instances, where the individual is aged, infirm, or suffering from constitutional disease, he awaits until the operation is indicated by recurrence of symptoms.

Dr. Willy Meyer, of New York, states that he believes it wise to search for and remove the appendix when operating for perityphlitic abscesses, provided the condition of the patient warrants such interference. For many years he simply drained such cases, and not more than from 5 to 10 per cent. of patients had trouble later on. In the exceptional instances, the symptoms were usually due to fecal concretions within or outside the appendix which had not been removed.

Dr. J. B. Murphy, of Chicago, says that he has had to re-operate on a large number of recurrent cases that had already been drained for abscess. The percentage has been sufficiently large for him to say to all patients operated on and drained, that they should come back and have the appendix removed as soon as they have recovered from the suppuration.

Dr. A. J. Ochsner, of Chicago, states that he has had so many serious recurrences in this class of cases that he now makes it a rule to always advise a secondary operation. Moreover, he forbids these patients taking any form of nourishment except liquids, mush, and soft-boiled eggs until they have the appendix removed.

Dr. Roswell Park, of Buffalo, writes that he hardly ever advises a secondary operation to remove the appendix which

was not hunted up and removed when an abscess was drained, unless it seems to be producing occasional or persistent, even though mild, symptoms or discomfort, *i. e.*, "so long as it remains innocent and inoffensive, I do not feel like disturbing it, but when it growls, I would urge its removal."

Dr. Joseph Price, of Philadelphia, writes that he holds hard and fast to early and complete work, a nil mortality hinging upon both; that diagnosis and surgery should be applied in cases of appendicitis before the abscess develops, and the condition ought never to occur; that he neither approves nor practises simple incision, as when perforation or gangrene exist, it favors all sorts of septic and mechanical complications.

Dr. Joseph Ransohoff, of Cincinnati, writes that after looking over his cases, he finds only three in which a secondary operation was necessary after incision and drainage of an appendiceal abscess. These cases recovered.

Dr. W. L. Rodman, of Philadelphia, writes that he does not remove the appendix at the first operation in more than one-third of his abscess cases. He drains with iodoform gauze, using a fan-shaped piece internally to protect the general cavity. The gauze is left in from five to eight days. Usually the wound is left open and the peritoneum is sutured to the skin with catgut to prevent its retraction. As soon as active suppuration ceases he removes the appendix and closes the wound. He believes, however, that if the appendix is not removed, but a small percentage of patients would have symptoms, as the suppurative process usually puts the appendix out of commission.

Dr. John A. Wyeth, of New York, writes that where there is an abscess of large size, he drains it through the smallest possible incision. After recovery he does not advise a radical operation for the removal of the appendix, unless, after an interval, symptoms of recurring appendicitis are present. In a fair proportion of cases there is no recurrence, and when a patient is advised to undergo a radical operation upon the first appearance of recurrent symptoms, he considers that the surgeon has performed his full duty.

So much for the opinions of the surgeons. Now for the histories of the patients. I have taken the group of 23 cases reported in my article, read before my State Society, the earliest operated on five years ago, the last, one year ago, selecting them because none were so old as to have developed intercurrent diseases, and none so recent as to have escaped the possibility of complications arising from the operation. Of these 23 cases I was able to trace all but one. This was a small boy, whose parents have moved and could not be located.

Brief History of Cases.

Case I.—Boy, aged twelve years; ill two weeks. Large abscess opened and drained; appendix not removed. He reports that he has had no subsequent symptoms. He has no hernia, and his general health is perfect.

Case II.—Man, aged twenty-two years; ill ten days. Large abscess opened and drained; appendix not removed. Reports that he has no hernia, has had no colic, does not suffer from constipation or indigestion, and that his health is better now than it was before the operation.

Case III.—Boy, aged fourteen years; ill four weeks. Large abscess opened and drained; appendix not removed. He has had no hernia, health excellent, and has not consulted a doctor since he left the hospital.

Case IV.—Man, aged forty-six years; ill two weeks. Large abscess opened and drained; appendix not removed. He has a slight hernia, no digestive symptoms, and his general health is good.

Case V.—Man, aged thirty-two years; ill ten days. Abscess incised and drained; appendix not removed. He reports that he suffers a little from constipation, has no hernia, and general health excellent.

Case VI.—Boy, aged fourteen years; ill twelve days. Large abscess opened and drained; appendix not removed.

He has no hernia, digestion is good, and has not suffered pain since the operation.

Case VII.—Man, aged twenty-four years; ill seven days. Large abscess opened and drained; appendix not removed. He has no hernia, digestion is good, and he has recently been passed for life insurance.

Case VIII.—Man, aged thirty-three years; ill ten days. Large abscess opened and drained; appendix not removed. He has no hernia, does not suffer from constipation or indigestion, and has not lost a day from work in the last two years.

Case IX.—Boy, aged seventeen years; ill nine days. Large abscess opened and drained; appendix not removed. He has a slight hernia, does not suffer from dyspepsia, and his health is good.

Case X.—Boy, aged nine years; ill six days. Abscess opened and drained; appendix not removed. He has no hernia, does not suffer with indigestion, and his present health is good.

Case XI.—Girl, aged eight years; ill ten days. Abscess opened and drained; appendix not removed. Her mother reports that "she had a small hernia, but it is now closed." She has had no constipation or dyspepsia, and is in better health now than at any time during her life.

Case XII.—Woman, aged nineteen years; ill four weeks. Large abscess opened and drained; appendix not removed. She has no hernia, and is as well now as before the attack of appendicitis.

Case XIII.—Woman, aged twenty-four years; ill four weeks. Large abscess opened and drained; appendix not removed. She has no hernia, her digestion is good, and her general health is excellent.

Case XIV.—Man, aged twenty-six years; ill two weeks. Abscess opened and drained; appendix not removed. He has no hernia, his digestion is perfect, and his general health is good.

Case XV.—Boy, aged ten years; ill two weeks. Large abscess opened and drained; appendix not removed. He has no hernia, his digestion is good; he has been free from abdominal pain, and his general health is perfect.

Case XVI.—Man, aged thirty-nine vears; ill two weeks. Large abscess opened and drained; appendix not removed. He has no hernia, does not suffer from constipation, has had no pain, and has not lost an hour from sickness since leaving the hospital.

Case XVII.—Man, aged sixty-two years; ill four weeks. Large abscess opened and drained; appendix not removed. He has no hernia, his digestion is good, does not suffer from constipation, has had no pain, and his health is very good considering his age.

Case XVIII.—Man, aged thirty-one years; ill three weeks. Large abscess opened and drained; appendix not removed. He reports that he has no hernia; that he has not had colicky pains, but he suffers a great deal from constipation and indigestion, and that his physician has recently advised him to come back and have the appendix removed.

Case XIX.—Woman, aged thirty-six years; ill five days. Abscess opened and drained; appendix not removed. Reports that she has no hernia, but her digestion is bad, and she has had two acute attacks of abdominal pain and fears it will be necessary to have another operation performed.

Case XX.—Man, aged twenty-four years; ill eight days. Large abscess opened and drained; appendix not removed. He has no hernia, has been free from pain, suffers some with constipation, and, except for boils, his general health is good.

Case XXI.—Boy, aged sixteen years; ill six days. Abscess opened and drained; appendix nor removed. Reports that he had a severe attack of pain after leaving the hospital, that the wound opened and discharged for two or three days, and then healed. The incision is now closed, he has no hernia, his digestion is good, and his general health excellent.

Case XXII.—Girl, aged eight years; ill five days. Abscess opened and drained; appendix not removed. Her mother

reports that she has no hernia, does not suffer from colicky pains, digestion is good, and that her general health is better since being operated on than it had been for a long time.

An analysis of these cases will show that all the patients are living from one to five years after the operation; that none has been operated on a second time; that all, with possibly one exception, are in good general health; that only two have had attacks of colicky pains; that two have a slight hernia; and that two suffer with digestive disturbances.

The result of my study of the opinion of the various surgeons quoted, and of the case histories of the number of cases collected, is, that while a surgeon may be justified in advising a secondary operation in all cases as theoretically the safest plan to follow, he is not justified in persuading, urging, or starving a patient until he consents to have it done. The appendix should always be removed at the first operation if the abscess is small and not adherent to the abdominal wall beneath the incision. It should be left only in neglected cases, where the abscess is large and attached to the parietal peritoneum. When this condition exists, the appendix is usually gangrenous, undergoes liquefaction, and is eliminated with the discharges. In such cases suppuration continues, as a rule, for several weeks, and before a secondary operation could safely be done, the patient is homesick, weakened physically by confinement, and depleted financially by the expenses incident to his stay in the hospital. Experience seems to show that if subsequent trouble develops, the infection is not usually acute, and pus, if it is formed, is walled in by old adhesions. Therefore, I think that the surgeon does his duty if he makes it clear to the patient that, owing to the complications which existed, it was not found safe to remove the appendix, and tells him that while a second operation is advisable, it is not imperative unless he has tenderness over the incision, colicky pains in the bowels, or persistent digestive disturbances, in any of which instances it is distinctly necessary for him to promptly seek surgical assistance.

DISCUSSION.

Dr. Le Grand Guerry, of Columbia, S. C.—This interesting paper of Dr. McGuire's should be read by the rank and file of the profession, and it would be a good thing if they could take in all of these discussons. All of us feel, I think, that the longer we operate and the more experience we have had, the less seldom do we leave the appendix behind.

To illustrate the matter in concrete form, I will say that in a series of nearly 500 appendix cases in the last three or four years, we have had 175 cases of localized abscess of the appendix. That is a pretty large proportion of localized appendix abscess. Out of these 175 cases, for various reasons the appendix was left behind in 30 instances. Out of 30 cases in which the appendix was left, 5 patients have been subsequently operated on and the appendix removed on account of the reformation of an abscess, and in one case for a persistent fistula beside the appendix. Three other patients have had their appendices removed by advice, but did not have any special trouble. However, for various reasons, it was thought best to remove them. So we have out of 30 cases in which the appendix was left, 8 in which operation was done for its removal subsequently. In 5 instances it was imperative to remove the appendix. I wish simply to give those figures in support of Dr. McGuire's paper. This fact is very significant, that of the 30 cases, all of them are alive, and of the 8 cases that came to a second operation they are all alive.

I have been very much interested in this paper, and it is not only timely but very practical.

Dr. Maurice H. Richardson, of Boston, Mass.—I want to add a word or two to this discussion by calling attention to this one point. If you will take the trouble to collect in a basin the pus of an appendix abscess, you will find sometimes, not always, the floating appendix. I have seen this so many times that, when men advocate the universal removal of the appendix at a second operation, I remind them that they may find no appendix there to remove. The rule should be to operate in every case in which there is a good reason for so doing, and not to wait for subsequent trouble. I have known two or three of my patients to die

of a second attack. Once an appendix is diseased, it is, I think, always diseased, unless it is cast off in the pus of the abscess. I take it that we all would remove the appendix, unless there was an abscess one or two weeks old. Then the man who tries to take out the appendix every time will get into trouble.

Dr. R. S. Hill.—Don't you think, Dr. Richardson, that close observation in the after-treatment, or even at the time of operation, will find the sloughing appendix if it comes out in that way?

Dr. Richardson.—Yes, I think so. It won't come out if the abscess is two weeks old, for the appendix will be in pieces. Sloughs suggesting a sphacelated appendix should be floated in a basin of water, when the appendicular nature will be evident.

Dr. R. S. Hill.—In any case in which the appendix is not found when the appendiceal abscess is opened, I believe, by closely observing the discharges, we can usually determine whether or not any portion of it has sloughed off, and I am gratified to hear Dr. Richardson, in reply to my inquiry on this point, express the same opinion. However, a necrotic mass representing only a part of the appendix, found in the discharges, may lead us to believe erroneously that the organ has been entirely destroyed. I, therefore, feel that there is no way of knowing absolutely whether or not the appendix has been removed as a source of future trouble, other than going down on the cecum and examining the parts. Now if there is any doubt about the appendix being destroyed, in my opinion, there is a "necessity" for a second operation. This necessity connected with the liability of a hernia, it seems to me should outweigh the danger connected with a second operation. According to the many quotations given by Dr. McGuire, the general opinion of the profession seems to be, that an appendix once diseased, always diseased and should be, sooner or later, removed. When a necrotic mass appears in the discharges the "necessity" for a second operation in all probability is not as great as when it does not appear, because it is an evidence of, at least, a partial destruction of the appendix.

When we are operating for hernia, which so frequently follows drainage, we should, in my opinion, never fail to expose the cecum and see that the primary source of trouble

is completely removed, even though a necrotic mass apparently representing the entire appendix, has come away in the discharges. This entails little if any additional risk.

Dr. W. P. Carr, of Washington, D. C.—Dr. McGuire touched on one point which ought to be emphasized a little more, and that is, in large abscesses a second operation would not generally be needed as the appendix will slough out of itself, and that he does remove the appendix whenever it is possible, and it is only in a case of small abscess, where the condition of the patient will allow it, that the appendix ought to be removed, and any large chunks of thickened omentum ought to be removed. I have seen deaths result from infection which spread from infected and thickened omentum, and if Dr. McGuire had put in the title of his paper "large appendiceal abscesses," I think we would all agree with him entirely; but, as it is there might be some confusion as to whether or not he meant simple acute cases in which there was a small amount of pus around the appendix.

Dr. Charles P. Noble, of Philadelphia.—We all agree I think, with the general position of Dr. McGuire. It seems to me, however, that there is an additional reason for postponing operation. We have worked over the same field in the pelvis. If one does a relatively early secondary operation, he operates in the midst of a fresh exudate, and, therefore, he leaves a raw surface, and then he gets intestinal adhesions, and so the patient has trouble. In other words, the patient is not cured. Therefore, that is an additional reason for waiting until all exudate has been absorbed, when you can operate in an aseptic field, with a normal circulation, so that if the patient does not have symptoms, the surgeon can wait for a hernia which is almost inevitable, and then operate; unless the patient is a travelling man, and then it is wiser to do an interval operation on the ordinary indications.

It is interesting to me to see how the general surgeon is going through the same processes the gynecologist went through years ago. And yesterday the same thing was up on the removal of the prostate gland. To illustrate the point, I will say in this connection that when Segond came to America years ago to teach vaginal hysterectomy, most of the operations at that time were done through the abdomen by Americans. He said, "You men in America who operate

through the abdomen put your fingers down, look up at the ceiling, wiggle your fingers around and get out the mass; but we, who operate from below, look down at the floor, put our fingers up, and wiggle our fingers and get the mass out from below," and that was the drift of the discussion on the prostate.

Dr. Randolph Winslow, of Baltimore.—In corroboration of what was said with regard to the disappearance of appendix, I will say that ten years ago I operated on a woman for a huge appendiceal abscess which precluded the removal of the appendix, and she got well and remained so for ten years. She fell into my hands again some time this year, when the trouble seemed as though it might be due to the appendix. In the course of time I opened the abdomen and explored the region of the appendix, and found that the appendix had practically disappeared. The trouble was not concerned with the appendix at all, but with some other source of pathology, so that the appendix, as has been said, may disappear either by a process of absorption or sloughing, or in some manner. In the same way, those of us who have lived long enough to remember the times previous to operations for appendicitis, will recall how we have seen numerous cases of appendicitis that were recovered from, and the patients subsequently remained well. As an illustration of this, I had a case in my own family in 1872, the patient having had an acute appendicitis from which recovery occurred and he never had another attack. There are other cases I am cognizant of, and it would seem that in many of these the appendices sloughed, the debris became absorbed, or discharged through the intestine, or in case the appendiceal abscess was opened by an incision, the sloughing appendix may have escaped with the discharges from the wound.

Dr. Edward H. Ochsner, of Chicago.—I should like to call attention to one point, a point which, however, cannot be proved by statistics, but one which I believe most of us have verified by experience. A considerable percentage of these patients in whom no recurrence has taken place are persistently below par. Some of them may not have stomach symptoms, and yet are not worth 100 per cent. until the appendix is removed. They have such digestive disturbances as interfere with the proper assimilation of food and are not entirely well until their appendices are taken out.

Dr. Charles H. Mayo, of Rochester, Minn.—This discussion has been very interesting to me, and I cannot refrain from taking a small part in it. In the abscess cases, where I do not remove the appendix primarily, that is, in most cases, I advise that this be done secondarily. The appendices which produce abscesses in the Northwest do not get quite so rotten; that is to say, I do not believe the appendix sloughs when we think it does. Long ago I used to think that the appendix sloughed out in some cases. I used to examine these collections of coagulated lymph, report them, and show them as the appendix; but I have operated many times subsequently and found the appendix. The appendix will not slough in your individual practice. If you operate for it, you will find it; it rarely sloughs. Of course, you must prove the rule by having one occasionally, as is reported.

As to the factor of personal equation, if you write a lot of letters to individuals who have had their appendiceal abscesses drained, and their appendices not removed, in regard to this matter, they would not be anxious for further operation to remove the appendix. But let us look at the other side. In nearly one-tenth of the cases that come to us, sick enough for something to be done, we cannot distinguish between chronic gall-bladder trouble and cases of appendicitis on account of reflex symptoms. If we could remove the appendix and stop the vomiting of pregnancy, we would do it. Interfere with the peristalsis of the appendix, and you get to a lesser degree some of the symptoms which you get from a strangulated hernia. A great many patients with appendicitis first have symptoms of stomach trouble, such as vomiting, which may come on before localized pain. These patients come to us and seek relief, and if we can relieve them for the time being, a great many of them will hesitate to have their appendices removed. They may suffer from reflex troubles, such as eructations of gas, indigestion, etc., which they get used to. They finally get to taking patent medicines and subsist on special foods that do not produce gas.

I want to compliment Dr. Noble on the stand he takes with regard to the gynecologists having taught surgeons so much. It is true, they furnished the yeast, from which developed general and abdominal surgery, and they are still furnishing the gas. (Laughter.)

Dr. John B. Murphy, of Chicago.—There seems to be great hope of getting together on appendicitis and on every phase of it, so far as I can see. We want to save, immediately, as many patients as we can who have this disease, thus lessening the liability of trouble to them subsequently. This naturally means the removal of the appendix at the primary operation whenever it is possible to do so.

With reference to large and small abscesses, I fear large abscesses very much less than I do small ones. Let us take a case of acute abscess, with a short mesentery, that has started over the iliac artery in a man who has been underworked, overfed, etc., and he is the one in whose case I am afraid to remove the appendix in the primary operation, where the disease has existed four days or upward. The large abscess case is one in which the surrounding tissues are coffer-dammed and protected by infiltration and fitted for attack; but the acute spreading abscesses are the ones that we lost at that period of the disease, before Dr. Ochsner laid stress on tearing up and traumatizing these tissues. These patients are the ones that are acutely infected and die from acute sapremia, because there is acute infection of the cellular tissue beneath the peritoneum and in the meso-appendix.

The other class of cases which furnishes mortality, particularly those in which there are large abscesses, are not the ones who have their appendices interfered with, but those in which the abscess remains long enough to have the portal veins thrombosed and infected, giving a pylephlebitis which always terminates fatally. This is one of the greatest dangers of delaying operation in cases with circumscribed suppuration.

I took exactly the position Dr. McGuire is taking, namely, that these cases should not be operated on secondarily unless they had acute symptoms, if they were to remain in reach of competent surgical hands should an acute attack come on. I have changed my position. These are the kind of appendices that give us abscesses. These appendices have had serious lesions. We are not dealing with a catarrhal appendix, or with one in which sloughing has taken place, or where there has been destruction of a portion of its mucosa, but we are dealing with one which is crippled, adherent, twisted, and which is an instrument of torture to the patient

until it is removed. The position I am taking today, and I am becoming more and more convinced that it is the right one, is that these appendices should be removed just as soon as the patients have fully recovered from their primary attacks, and can have them removed. I will not take out an appendix while the tissues are still infiltrated. A fresh, uninjured, uninfected peritoneum is a dangerous one to work in. It is the taking out of appendices two or three weeks after the primary abscess has been drained and conditions restored, practically to normal, that gives the best final results.

Dr. R. M. Cunningham, of Ensley, Alabama.—The personal equation has been suggested in connection with this discussion, and I have been impressed for a great many years with the importance of this and the influence it exercises in the opinions of surgeons and physicians. Now, a surgeon loves to operate for appendicitis; I will not say he is glad when an appendicitis case comes to him, but he does not show a great deal of sorrow. The surgeon who confines his operations largely to other departments of our art is always sorry when a case of appendicitis comes to him, because he does not want to operate if he does not have to. I belong to that class. The severe, bad cases I operate on; the easy ones I send to an expert, because I have time. That is the difference. (Laughter.) I have had a good deal of experience in abscess cases, and I am free to confess that in my first experience the results were not good, because I hunted for the appendix. I have long since adopted the policy of looking upon this operation in the presence of abscess, as a life-saving measure, and experience has taught me that the opening of these abscesses in the majority of cases is curative. My experience covers a period of eight years in dealing with this class of cases. The last one was operated on two weeks ago.

It seems to me, in considering this whole subject, there is a surgical principle to be borne in mind. There is a cause for an abscess, and sometimes the opening of the abscess is a life-saving operation, with all future trouble disappearing. I have had the experience of seeing the appendix floating out with the pus, and mesentery too. I have not only seen that, but have seen feces escape as well. My experience has been that if we stop with that procedure, the patients will get well, but I have always told them that later on it

may be necessary to remove the appendix. These cases should be viewed from the standpoint of a broad surgical principle, like cases of fistula in ano, which sometimes get well by simple incision. Osteomyelitis is sometimes cured by incision. It is a life-saving operation. Buboes and tuberculous glands, and similar conditions, sometimes disappear by simple incision and drainage, and there is no need for further radical operation. That is a common observation.

One word in regard to hernia. I believe it can be prevented. I have had some cases of hernia—I do not know the exact percentage. But I believe hernia can be prevented largely by putting through-and-through sutures in the skin, muscle, fascia, and peritoneum, and, as the pus disappears, gradually tie and close the opening, and in that way you will often prevent hernia.

Dr. McGuire (closing).—My friends have been much kinder to me in this discussion than I had expected them to be. I think what difference of opinion exists among us is due largely to our difference in classification of abscesses. I wish to be emphatic in saying that in a small abscess, not adherent to the parietal peritoneum, I think the appendix ought to be removed in every case at the primary operation, and it should only be left when the abscess is large and adherent to the parietal peritoneum beneath the incision. My practice comes from a sparsely populated and poor community, and cases often come to me three, four and five weeks after the inception of the disease; therefore, I have had more of these abscesses in proportion to the cases I have operated on than is the rule with the metropolitan surgeon. I admit that I leave fewer and fewer appendices. Each year the records of the hospital show a larger proportion of appendices are removed, due not to increased experience or greater manual dexterity, but to the fact that the laity and profession are being educated to the wisdom of earlier operation. One great mistake sometimes made by a surgeon is in not being frank with a patient after draining an abscess and telling him the appendix was not removed. I know of two suits for malpractice which are now pending because the patient was told at the time of the primary operation the appendix was not removed. I am free to confess that if I personally had a large neglected abscess,

opened and drained, I would have my appendix taken out at the first opportunity, whether I had symptoms or not. But it is an elective operation, and it is a moral question whether the surgeon has a right to tell a patient that it is imperative to remove the appendix, or whether he should be content simply with stating that it is advisable to do so and then leave the decision of the matter in the patient's hands.

RESECTION OF THE BOWEL, WITH A REPORT OF ELEVEN CASES.

By J. Shelton Horsley, M.D.,
Richmond, Virginia.

The basis of this paper is a series of eleven intestinal resections, comprising all operations of this nature that I have done since the opening of Memorial Hospital, July 27, 1903, a little more than five years ago. Before reporting these cases, it may be of interest to take up the question of technique, for in probably no other operation is attention to every detail so essential to success as in uniting a divided intestine.

I have attempted to point out elsewhere[1] the advantage of a continuous intestinal suture penetrating all coats, not only over mechanical appliances, but over the interrupted suture. The desirability, or, rather, the absolute necessity, of taking a portion of the submucous coat in each suture was first shown by Dr. Samuel D. Gross in 1843, and this idea was emphasized and elaborated by Dr. W. S. Halsted in 1887, and is now generally accepted. Dr. F. G. Connell has called attention to the impossibility of catching a portion of the submucosa in each stitch without perforating it, as the submucosa is about $\frac{1}{250}$ of an inch thick, whereas the diameter of the ordinary intestinal needle will vary from $\frac{1}{50}$ to $\frac{1}{100}$ of an inch. It can readily be seen that it is difficult, if not impossible, to split a membrane with an instrument whose diameter is several times greater than the thickness of the membrane. The only logical conclusion is that if the submucosa must be

[1] Annals of Surgery, November, 1903.

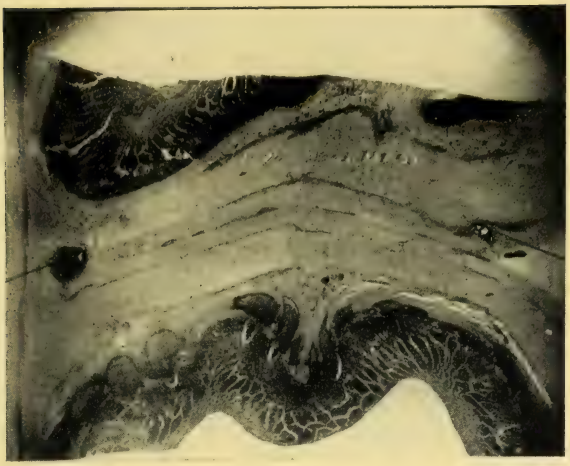


Fig. 1.—Photomicrograph under low power of a cross-section from a specimen in which two loops of a dog's intestine were united by two parallel rows of sutures. Distance between these rows was about 1 cm. and the bowel between these two rows was absolutely approximated. The illustration shows complete union between the approximated surfaces of the peritoneum at the point at which this section is taken. A shows the silk suture cut across.

Fig. 2.—Photomicrograph under low power of a cross-section of a specimen from another experiment similar to the one mentioned under Fig. 1. This shows apparent lack of union in some of the space between the two rows of sutures.

caught in each stitch it is necessary to penetrate the submucosa and enter the lumen of the bowel.

Whether a continuous or an interrupted suture should be used seems to be not so well settled as the necessity of catching the submucosa in each stitch. It has been generally taught that simple approximation of the peritoneum is all that is necessary in intestinal suturing. When two serous surfaces unite it is because of a definite lesion. Adhesions of the pleura form because of previous inflammation and subsequent destruction of some of its endothelium; so adhesions of the peritoneum are accepted evidence of former damage. It would be contrary to our knowledge of surgical pathology if we found that the mere approximation of two serous surfaces, without injury of any kind, would cause them to adhere. In a series of nine experiments by the writer, reported before this Society in December, 1904, two loops of intestine were sutured together with parallel rows of continuous sutures. After a definite time the dogs were killed and the specimens carefully removed and examined by a competent pathologist[1] (Figs. 1 and 2). In only four instances was there complete union of the apposed surfaces, and in two of these large coarse silk was used which caused much more reaction. These experiments have been criticised by Dr. A. H. Gould, of Boston. In his book[2] he says: "Horsley's experiments did not take into account the effect of the cut edges in pouring out serum into all parts of the joint." When a single row of sutures is employed, the cut edges of the intestine are invaginated into the lumen and at first have nothing to do with the healing, which takes place along the line of sutures and later extends to the cut edges. Most, if not all, of the serum and lymph from the cut edges would naturally drain into the

[1] I am under many obligations to Dr. J. S. Davis, formerly Professor of Pathology in the University of Virginia, for a report on these specimens; and to Mr. A. H. Tuttle, Professor of Biology, for the photomicrographs.

[2] Operations upon the Intestines and Stomach, p. 97.

lumen of the bowel. The mere presence of aseptic serum does not insure permanent union between approximated peritoneal surfaces. It is like the coagulated serum, or scab, on a slight wound about the face, and acts mechanically by protecting the wound and holding it together. This coagulated serum takes no active part in the permanent union of sutured bowel surfaces, which is accomplished, like healing everywhere else in the body, by granulation. It is poured out because of the trauma to the bowel caused by the suturing and the section, and is absorbed in a few days. The first permanent union is effected by the granulations that spring from the part of the serous coat of the bowel that has been injured either by the application of the needle and thread or by the pressure exerted by the thread. Later on the other coats regenerate, the mucosa being completely repaired within three weeks, and the submucosa, which is the last to regenerate, within eight weeks.[1]

Mere approximation of the serous coats, then, is not sufficient to insure healing in every case unless there is some form of trauma, but the peritoneum should be brought together firmly enough to cause a mild pressure necrosis along the whole line of sutures. This latter condition can be fulfilled by the continuous and not by the interrupted suture. The splint-like action of the continuous suture is another great point in its favor, for it holds the bowel wall in a firm grasp and does not permit alternate stretching and collapse of small segments of the intestine with each peristaltic wave, as must occur between the interrupted stitches.

The essentials for success in an intestinal suture are: (1) That it shall penetrate the lumen of the bowel each time in order to be sure of a firm hold on the submucosa; (2) that it shall hold the approximated serous coats like a splint as near the cut margin of the bowel as possible; (3) that it shall produce equal and sufficient pressure at each point along the

[1] F. Mall, Johns Hopkins Hospital Reports, vol. i.

line of suture to cause a mild pressure necrosis and so insure union at each point. The continuous right angle suture, penetrating all coats, seems to fulfil these conditions. The rapidity with which such a suture can be applied is another great advantage, as speed in intestinal surgery is one of the chief elements of success. Capillarity has been proved to be of much less importance than was formerly supposed, but when it does occur drainage would be carried toward the knot. With a continuous stitch both knots can be placed inside the lumen and the danger of a series of interrupted sutures, that act like wicks, is thereby obviated.

The anxious part of an end-to-end union is the mesenteric border, where leakage frequently occurs. The separation of the two coats of the peritoneum just before surrounding the bowel leaves a small triangular area denuded of serous covering, which, of course, does not unite so promptly as the peritoneal surface. While writers on intestinal suturing have called attention to this space because of its lack of peritoneum, there is another danger that has not been mentioned. During a resection, when the bowel is cut through from the free surface to the mesenteric border, a certain amount of the contents of the bowel is always present, even though small in amount. This bowel contents naturally spreads over the triangular area that has just been alluded to, and the scissors or knife with which the infected lumen of the bowel has been cut severs this space also. In this manner the triangular area which is uncovered by peritoneum, and is made up of loose areolar tissue rich in lymphatics and bloodvessels, receives the septic matter from the bowel, and an excellent opportunity for absorption and infection is afforded. Of course, the bowel contents is promptly mopped off, but such surfaces absorb quite rapidly and the presence of septic matter in so highly absorptive a tissue for even the shortest time would be likely to cause infection. It is a question whether much of the leakage that has been described as occurring at the mesenteric border is not due to infection of this area at the time of

operation. The germs and toxins that have already been taken up by this space would be likely to prevent union here no matter how carefully the peritoneum was afterward brought together by skilfully placed mesenteric stitches.

In order to obviate this technical defect I have adopted a method which is best shown in the accompanying illustration (Fig. 3). Before the lumen of the bowel is opened and after the intestinal clamps have been placed, the mesentery is divided well up to the bowel wall. The triangular area is grasped with hemostatic forceps and a ligature of fine silk or linen is tied around this area, so occluding this space and obviating infection when the lumen of the intestine is subsequently opened. This also makes the peritoneal covering of the bowel complete. When union is made, care is taken that these two ligatures are not in front of each other, but are placed side by side by having the mesenteric border of the ends of the intestine a little out of line. This prevents any "lumpiness," which would make neat suturing at this point more difficult.

It is the practice of some surgeons to do a lateral anastomosis rather than an end-to-end union whenever possible, because of the difficulty of dealing with the mesenteric border. The suggestion just made in regard to the treatment of this triangular space may eliminate this difficulty, but there are serious objections to the lateral anastomosis from a physiological standpoint. Cannon and Murphy[1] have studied under *x*-rays the functional results in dogs after both end-to-end and lateral union, and present the matter as follows:

"Observations were made on different animals one, four, seven, and ten days after end-to-end union of the intestine. In no case was the slightest evidence of stasis of the food in the region of operation to be observed. The food passed along that part of the intestine as it passed along other parts.

"The results were quite different with lateral anastomosis. Animals permitted to live ten days or two weeks showed

[1] Annals of Surgery, xliii, 512

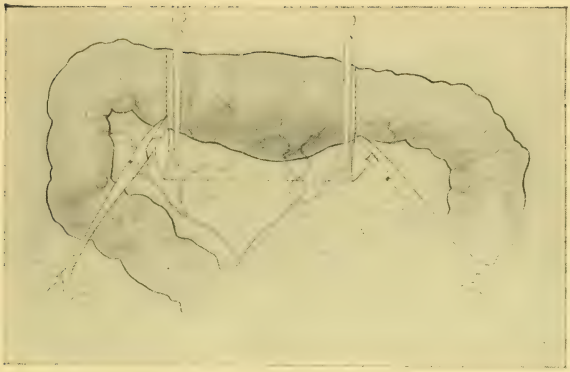


Fig. 3.—A diseased segment of bowel has been clamped off, and is ready to be removed. Part of the mesentery has been divided and the triangular area formed by the separation of the peritoneum of the mesentery just before surrounding the bowel has been clamped with hemostatic forceps. The next step in the operation would be ligating the tissue included in the grasp of the hemostatic forceps, and then section of the mesentery and bowel along the dotted lines.

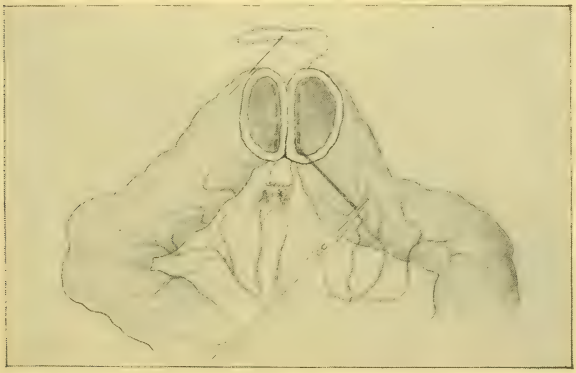


Fig. 4.—The diseased segment of bowel has been removed and the vessels in the mesentery have been tied. The triangular spaces, which have been caught with hemostatic forceps and ligated, are behind the sutured intestine and cannot be seen. A continuous mattress suture has been begun, the knot tied, and the short end of the suture has been clamped with a small forceps while the needle has continued the running mattress suture. The needle has pierced the bowel wall, appearing on the peritoneal surface, and is just taking the first suture of the continuous right angle stitch penetrating all coats. The rest of the suture is finished in this manner around to the knot and is concluded by tying the thread to the end of the suture which is clamped in the small forceps. This brings the knot within the lumen of the bowel and makes practically only one knot for the entire row of sutures.

usually the condition already mentioned as observed by Senn and Reichel—a more or less complete blocking of the canal by accumulated hair and undigested detritus at the opening between the apposed loops. In order to see whether there was a stoppage of the normal food at the anastomosis, animals were operated upon and carefully fed for four days on food with little waste. Then they were given a rather thin boiled starch (4 grams starch to 100 water) with an admixture of subnitrate of bismuth. As long as this food was passing through the intestine some of it was always present at the junction. And when almost all the unabsorbed material was in the colon there still remained a large mass filling the widened lumen where the coils were laterally joined. Observation the next day showed the mass still at the anastomosis. Autopsies on these animals proved that the stasis of the food was not due to previous accumulation of indigestible waste. The region of junction was filled, not with hard material, but with a pasty stuff, in physical characteristics much like that seen ordinarily in the small intestine, and certainly capable of easy transmission through the gut by peristalsis. It is evident that in these cases the two apposed coils did not act together to propel the enclosed food. The food was forced through the region of the union by a push from behind, a push exerted by the peristalsis of the intact wall driving new particles of food from time to time into the accumulation at the junction. And when no food remained to act as an intermedium between the accumulated mass in the widened lumen and the pressing peristalsis of the intact gut there was nothing to continue the propulsion of the food through the chamber formed by the united loops, and the mass was left unmoved."

In this series of eleven cases there was one death. The series may be classified in two ways: (1) According to the treatment of the divided ends of the intestine, and (2) according to the pathological conditions found. According to the first classification there were two cases in which the intestine was resected, but no union attempted. One of these cases

had a volvulus of the sigmoid and descending colon, and not enough of the rectum was left for subsequent union. In another patient the cecum, which was the site of a sarcoma, was resected and the intestine brought into the wound. This patient left the hospital with a satisfactory immediate recovery from the operation, but died later from metastasis.

The second group consists of one case in which the Murphy button was used. The lower part of the sigmoid and upper part of the rectum had been much injured in dissecting it loose from dense adhesions while removing pus tubes. On account of the extensive raw surface and the necessity for uniting the bowel deep in the pelvis, sutures were not deemed advisable and the Murphy button was used. The patient made an uneventful recovery.

The third group consists of one case in which both the Murphy button and sutures were used. It was one of the early cases in the series, and as the intestine did not appear in good condition I was afraid to trust sutures alone, consequently a Murphy button was used and sutures applied over this. The patient recovered, but had a large fecal fistula, which eventually closed. This was the only fecal fistula in any of the intestinal unions.

The fourth group consists of seven cases in which union was made by a continuous right angle suture penetrating all coats of the intestine. The mesentery was treated in the manner above described wherever possible. Sometimes, as in the case of tuberculosis of the cecum, the mesentery was so contracted and thickened that this technique could not be satisfactorily carried out. In the large intestine a double row of sutures was used, the inside row being chromic catgut uniting the cut margins, and the outside row a continuous right angle stitch of silk or linen penetrating all coats. This difference of technique in the large bowel is because of the irregular surface of the large intestine and the solid character of fecal matter, which makes considerable strain on the line of union. In the small intestine only one row of sutures is used.

The technique employed here is as follows: After the bowel has been clamped, the mesentery divided, and the mesenteric border ligated, as above described, the bowel is cut across as close as possible to the clamps that occlude the diseased segment. The ends are then disinfected with moist gauze and approximated so as to resemble a double-barrelled shot gun. Two small tenacula forceps, as recommended by Allis, for holding the bowel in position, are of much service.[1] A straight intestinal needle carrying a linen suture starts from the mucous membrane and transfixes the wall of each end of the intestine about one inch from its mesenteric border, the ligated triangular spaces having been placed side by side. The needle is then brought back in a reversed direction and the thread tied, making a mattress suture with the knot on the mucous membrane. A small clamp is placed on the short end of the suture, and the needle continues the suture line in a similar manner across the mesenteric border, making a continuous mattress stitch. When about one third of the circumference has been approximated in this way the needle is brought through onto the serous surface by penetrating from the mucous membrane, and the suture is continued as a right angle suture, penetrating all coats until the point is reached where the original knot was tied. Here the stitch is terminated by tying it to the short end that was left after making the first knot. This draws the knot into the bowel, making practically only one knot, and that placed within the lumen. For greater security one Halsted stitch is inserted at this point, and one stitch is also placed at the mesenteric border. It will be seen that the continuous mattress stitch is *identical in effect* with the continuous right angle stitch penetrating all coats, the only difference being in the method of application. If after the continuous mattress stitch has been applied from the lumen the bowel be inspected from its serous coat, this will be readily appreciated. It is important to see that the line

[1] Annals of Surgery, xxxv, 352.

of suture lies smoothly and snugly after each stitch; the assistant should keep the thread taut at all times. If too much slack is left, it is impossible to secure neat coaptation by tightening the sutures later, and unless the parts are brought snugly together there will not be enough pressure along the suture line to insure firm union. It must be remembered that whatever the objections may be to the Murphy button, the scar resulting from its use is almost ideal, and this scar is produced by a continuous uniform pressure along the line of union. An intestinal stitch, then, must insure not only approximation, but *a certain amount of pressure at each point*, and in order to maintain this the tension, as each stitch is made, must be regular and uniform.

In these seven cases there were eight resections, as in one patient a double resection was done. Six patients made an uneventful recovery so far as the intestinal operation is concerned. One patient, who had been a chronic alcoholic for years, died on the third day from suppression of the kidney and liver functions. This was the only death in the whole series.

Classifying these cases according to their clinical and pathological features, we have the following groups: (1) Strangulated hernia, 4 cases; (2) obstruction from a band, 1 case; (3) volvulus of the sigmoid, 1 case; (4) malignant tumor, 2 cases; (5) tuberculosis of the cecum, 1 case; (6) damaged bowel from pelvic operations, 2 cases.

Taking the first and most numerous group, strangulated hernia, in each instance the bowel was decidedly gangrenous at the time of operation. Two of the herniæ were femoral, one in a man and the other in a woman; the other two were inguinal, both in men.

There was one death.

Case I.—Mr. F. P. B., white, aged thirty-eight years. Admitted to the hospital October 26, 1904; discharged December 20, 1904; anesthetic, ether. Referred by Dr. H. H. Levy, of Richmond, Virginia.

The patient had always been a delicate man, and had a sunken nose and scars indicative of a late stage of syphilis. He was thin and emaciated, and had suffered from a femoral hernia on the right side for many years. Immediately after consultation the patient was sent to Memorial Hospital and operated upon. After resecting about four inches of markedly gangrenous small bowel and uniting it with sutures, the color of the intestine at the site of union appeared worse than when the operation was begun; so several inches more of the bowel were resected, including the line of union. Knowing the patient's frail health and fearing the stitches would not hold in the somewhat damaged intestine, a Murphy button was used and a continuous line of sutures placed over this. A drainage tube was inserted. The patient reacted satisfactorily, but the fourth day after operation some fecal matter appeared through the drainage tube. The fecal matter increased in amount, and within a week from the operation a large quantity of liquid feces flowed through the site of drainage. This continued for about five weeks, when it suddenly diminished in amount and within a few days ceased entirely. The sinus healed rapidly after the discharge of fecal matter ceased. The patient left the hospital in fairly good condition fifty-five days after operation.

Case II.—H. W., colored, male, aged thirty years. Admitted to the hospital February 21, 1905; discharged March 19, 1905; anesthetic, ether. Referred by Dr. F. M. Reade, of Richmond, Virginia.

The patient had a left strangulated inguinal hernia with about three inches of gangrenous small intestine. The patient was operated on at my clinic, which was in progress when he was admitted. Twelve inches of small bowel were resected and union was made by a continuous suture accord- to the method already described. No attempt was made to cure the hernia, but a tube was inserted through the hernial ring for drainage. This was removed in a few days. There was no suppuration, and the patient made an uneventful

recovery. Later on he was operated on successfully for the radical cure of his hernia.

Case III.—Mr. P. P., white, aged sixty-two years. Admitted April 13, 1906; died April 15; anesthetic, chloroform and ether. Referred by Dr. J. Fulmer Bright, of Richmond, Virginia.

The patient had been a chronic alcoholic for many years. He had a large strangulated inguinal hernia on the left side which had been incarcerated for a long time. After opening a rather thick, fat sac a gangrenous loop of small intestine was found. The ring was enlarged, healthy bowel brought down, and the gangrenous portion removed. Union was accomplished by a continuous right angle suture through all coats. After returning the sutured bowel to the peritoneal cavity it was noticed that the sigmoid apparently blended with the sac. The sac at one point was thick and boggy, but no particular attention had been paid to this at first, as the patient was in a bad condition and every effort was being made to complete the operation as rapidly as possible. It was found, on closer examination, that the sigmoid constituted a part of the sac. Its mesenteric folds had gradually separated and the extraperitoneal portion of this intestine protruded through the inguinal canal, while its mesenteric layers gradually turned wrong side out. The sigmoid and its separated layers of mesentery formed the sac into which the small intestine had prolapsed and become strangulated. This was a typical example of the so-called "sliding hernia," or "hernie par glissement" of the French,[1] Treigney,[2] and Savariaud.[3] The sigmoid had evidently been in this position so long and had become so thoroughly adjusted to its new location that it could not be returned to the abdominal cavity without considerable dissection, which probably would have impaired the nutrition of the bowel. So the portion of the

[1] Weir, Medical Record, February 24, 1900.
[2] Thèse de Paris, 1887.
[3] Revue de Chir., 1901, No. 11, p. 564.

sigmoid involved in the sac was resected and the bowel ends united by an inner row of continuous chromic catgut and over this a row of continuous right angle sutures penetrating all coats. The patient left the table in fairly good shape, and during most of the day following the operation seemed to be doing well. A few hours later, however, he became jaundiced and symptoms of uremia appeared. He became rapidly worse, and died on the third day after the operation. A postmortem was made by Dr. E. G. Williams, pathologist to the Memorial Hospital. An examination of the abdominal contents showed no sign of leakage at the site of either union, the sutures were holding firmly, and there was no evidence of any inflammation of the peritoneum. His liver was hobnailed. The small intestine contained a few ounces of blood, though none had appeared in any bowel movement. There was not enough blood to affect materially the final outcome, which was due, in all probability, to suspension of the liver and kidney functions following the large amount of anesthetic necessary in a man who had been a heavy drinker for years.

Case IV.—Mrs. W. T. P., white, aged sixty-five years. Admitted to the hospital August 13, 1906; discharged August 31; anesthetic, ether. Referred by Dr. J. H. Hinchman, of Richmond, Virignia.

The patient had a strangulated femoral hernia which her physician had attempted to reduce, but as reduction was impossible she was referred to me for immediate operation. A loop of small intestine was found gangrenous, and about six inches were resected, the ends being united by a continuous right angle suture in the manner indicated above. She made an uneventful recovery and was discharged from the hospital after eighteen days, the wound healing without inflammation.

In the second group of cases, obstruction from a band, there is one case and no death.

Case V.—Daisy T., colored, aged twenty-one years, unmarried. Admitted to the hospital August 2, 1908; discharged September 9; anesthetic, ether. Referred by Dr. Angus Nichols, of Richmond, Virginia.

On admission the patient had symptoms of partial mechanical obstruction, and there was some distention. After washing out her stomach and withholding all food and purgatives she seemed better, but the next day her pulse became weak and rapid, going to 120, the distention increased, and she was operated on at once. The small intestines were moderately distended and a band was found stretched from the right iliac fossa to the root of the mesentery, crossing the ileum about eight inches from the cecum and producing complete obstruction at this point. The band was divided, and the intestine beneath it was found to be partly gangrenous. The patient's condition was very bad, her pulse being 175. The affected loop of intestine was drawn into the wound, fastened by a few stitches, packed around with iodoform gauze, and freely opened. A tube was inserted in the proximal end. The patient improved, the fistula discharging large amounts of gas and liquid feces. On August 15 she was again operated upon in the following manner: After the artificial anus had been cleansed and packed with gause, an elliptical incision was made around the enterostomy, including the adjacent skin. This was carried down to the fascia on each side and the peritoneal cavity entered. The intestines and the artificial anus were separated from the parietal peritoneum and numerous adhesions dissected loose. During this time the artificial anus and its attached tissues were kept wrapped in gauze. The intestine was brought into the wound, clamped, and the whole mass of tissue, including the intestine and the enterostomy opening with its attached skin, was resected. The ends were sutured according to the method described above. On account of the infiltration and vascularity, an extra internal row of sutures was placed in the mesenteric border, extending half way around before applying the right angle suture. A tear in the bowel, caused by separating the adhesions, was repaired and the diseased appendix removed. A drainage tube was put in the lower angle of the wound. The patient left the table in a very bad condition, her pulse being

180; but under continuous rectal saline infusion and hypodermoclysis she rapidly recovered. There was some discharge of bloody serum through the tube for the first twenty-four hours, but very little after this time. The patient made an uneventful recovery. She suffered a good deal of pain for ten days, which was due to breaking up the adhesions of the enterostomy to the parietal peritoneum. The method of protecting the abdominal cavity from infection, by excising the artificial anus and its attached tissues and skin in one mass and keeping the mass covered with gauze, proved very satisfactory. The specimen with the attached skin is shown in the accompanying photograph. This case, as well as the next one in this series, has been reported more fully in a paper read before the Medical Society of Virginia as illustrating some of the forms of mechanical obstruction.

The third group, volvulus, consists of one case with no death.

Case VI.—S. F., colored, male, aged forty years. Admitted to the hospital August 17, 1908; discharged September 11, 1908; anesthetic, cocaine. Referred by Dr. J. D. Terry, of Rice Depot, Virginia.

The patient was a deaf mute, so it was difficult to get any history, but he had evidently suffered from the obstruction for several days. When he was admitted to the hospital his abdomen was enormously distended; pulse rapid, about 140, and feeble. Coils of intestines could be seen through the abdominal wall. There was no peristalsis. Owing to the patient's desperate condition, cocaine was used and an incision made over the region of the cecum. When the abdomen was opened some dark,thick fluid escaped, and a large tumor could be felt with the finger near the middle line. Another incision was made in the median line and an enormously dilated and gangrenous sigmoid which had become twisted on itself was found. The descending colon and the sigmoid were gangrenous and were removed. The descending colon was doubly clamped, the lower part of its mesentery and that of the

sigmoid were ligated in sections, and the gangrenous bowel removed from above downward. Though partly gangrenous, enough of the upper rectum was left in order to stitch it in the lower angle of the wound. It was thought better to do this than to divide the rectum deep in the pelvis where it was vascular, and where neither bleeding nor infection could be readily controlled. The proximal end of the clamped colon was brought down and stitched to the upper angle of the wound. A purse string suture was placed along its margin, the clamp removed, and a large rubber tube inserted. Then the purse string was snugly tied around the tube. Iodoform gauze was packed around both intestinal openings and the middle part of the wound closed. The patient was quite ill during the following day, but after this he made a rapid and satisfactory recovery. The upper part of the rectum sloughed off. He left the hospital September 11, in good general condition.

The fourth group, malignant tumor of the bowel, consists of two cases with no death.

Case VII.—Z. F., white, male, aged six years. Admitted to the hospital February 10, 1906; discharged March 3, 1906; anesthetic, ether. Referred by Dr. C. A. Blanton, of Richmond, Virginia.

The patient gave a history of a marked attack of constipation, and on February 10, in consultation with Dr. Blanton, we felt a movable lump in the right iliac fossa about the size of a large egg. There was some distention and slight tenderness over the mass; temperature normal. A diagnosis of chronic intussusception was made. He was operated upon the day of admission, and the mass proved to be a tumor of the cecum. As the mesentery of the ascending colon contained numerous nodules, the case was deemed inoperable from a curative standpoint; however, to relieve the symptoms of obstruction, the cecum, which was the seat of the tumor, was excised after the bowel on both sides had been clamped. The ascending colon and the ileum were brought into the wound,

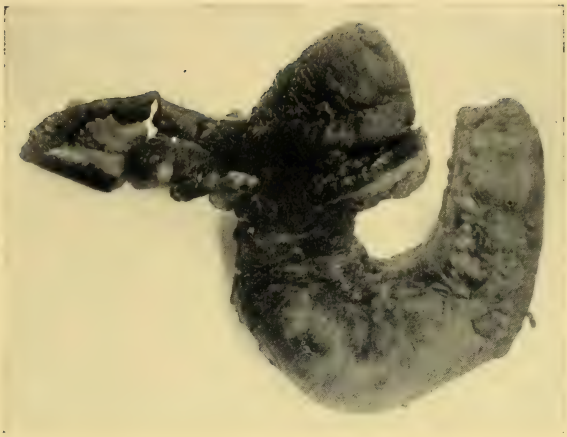


Fig. 5.—Photograph of a specimen removed from Daisy T., Case 5, showing attached skin and scar of the previous operation. By keeping this mass covered with gauze and removing it in one piece, infection of the peritoneum was avoided.

Fig. 6.—This drawing shows the position of the tumor in Case 8, Mrs. W. C. W.

fastened with sutures, and packed around with gauze. As the obstruction was not of an acute variety, the clamp was left on each end of the intestine for thirty-six hours. The lumen of the bowel at the site of the neoplasm was hardly the size of a small pencil. Convalescence, so far as the operation was concerned, was uneventful. Soon after the patient left the hospital his liver became enlarged and he developed ascites. He rapidly sank, and died three and one-half weeks after leaving the hospital. Microscopic examination of the tumor showed it to be a very vascular round-celled sarcoma.

CASE VIII.—Mrs. W. C. W., white, aged twenty-three years. Admitted to the hospital October 13, 1906; discharged November 15, 1906; anesthetic, ether. Referred by Dr. J. B. Bailey. of Clayville, Virginia, and Dr. E. W. Gee, of Richmond, Virginia.

About four weeks before admission to the hospital the patient had been delivered, normally, of a healthy baby. She had suffered with constipation for a number of years. About three days before admission she had severe colicky pains in her abdomen, with absolute obstruction and gradually increasing tympanites. A median incision was made. Both the large and small intestines were distended. Exploration with the finger disclosed a hard mass involving the lower part of the sigmoid. On account of the great distention, this mass could not be inspected. The patient's condition would not permit of a prolonged operation, so the descending colon was drawn into the wound, fastened with sutures, packed around with gauze, and opened. She recovered promptly from the operation, discharging large quantities of gas and fecal matter. On October 24, 1906, she was again operated on under ether, an incision being made in the left rectus, exposing the mass that had been previously felt (Fig. 6). It was firm and but slightly movable, and involved the lower sigmoid. It was dissected loose and brought into the wound. On the adjoining portions of intestine and the neighboring broad ligament and parietal peritoneum were small, yellow

nodules, about the size of a pin head, that resembled tubercles. Thinking the case one of tuberculosis, on account of the tubercular-like nodules and the age of the patient, the mass was excised. The irregularity of the bowel ends and its vascularity made it advisable to insert two rows of sutures. The inner row of chromic catgut in a round needle secured all bleeding points and approximated the bowel ends. Outside of this was placed a continuous right angle suture of silk penetrating all coats. Through a stab wound a drainage tube was carried down to the site of operation and the wound closed. The patient made an uneventful recovery. The artificial anus gradually closed without any further operation. A section of the specimen showed that practically all of the bowel had been destroyed by the growth, which was thick and firm. The caliber of the intestine at this point had been reduced to about the size of a uterine probe (Fig. 7). The immediate cause of the acute obstruction was the absolute blocking of this narrow canal by a clove. A section under the microscope presented such an unusual appearance that the specimen was sent to Dr. Joseph Bloodgood, of Baltimore, who pronounced it a rather rare form of carcinoma in which the protoplasm of the cell had undergone colloid degeneration, shoving the nucleus to the periphery of the cell. This kind of growth is most likely to be found in the young, and grows slowly, so it probably made its first appearance in this patient before she was twenty-one. A full description of the pathological findings and microscopic sections will be reported in another communication. The patient left the hospital thirty-three days after admission in good condition and rapidly improved in health and weight. For ten months she did well, but in August, 1907, further symptoms of obstruction developed. September 20, 1907, she was re-admitted to the hospital and again operated upon. As had been anticipated, there was recurrence not only in the bowel wall, but on the parietal peritoneum and all the adjacent tissues. Nodules were scattered along the whole length of the descending colon.

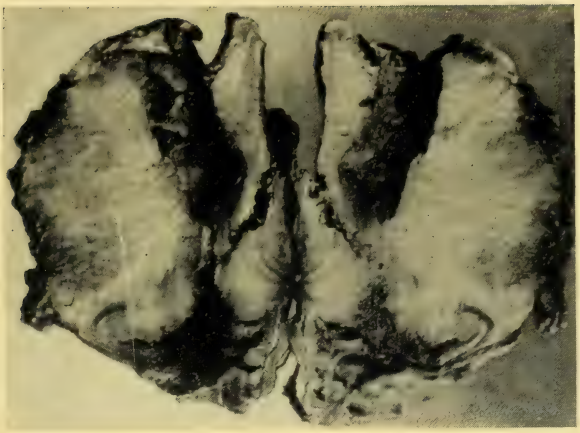


FIG. 7.—Photograph of the specimen removed from Mrs. W. C. W., Case 8. It has been opened along the lumen.

FIG. 8.—Photograph of specimen from Case 11, Mrs. P. O. R. Hypertrophic tuberculosis of the cecum. The landmarks of the cecum have been destroyed by the disease. Note on the mesenteric border the tuberculous cavity, A; also the enormous thickening of the intestinal wall with diminution of the lumen. The upper half of the cavity still contains cheesy material. The specimen has been opened from its free border and is held together by the mesentery.

It was impossible to excise the neoplasm, so the upper part of the descending colon was brought into the wound and a colostomy performed. The patient left the hospital after three weeks and returned to her home. She gradually failed, and died about three months later.

The sixth group, injury to the bowel occurring during pelvic operations, consists of two cases, which are of interest chiefly from the standpoint of the intestinal resection. There was no death.

CASE IX.—L. W., colored, single, aged twenty-one years. Admitted to the hospital June 23, 1906; discharged July 22, 1906; anesthetic, ether. Referred by Dr. J. A. Keck, of Richmond, Virginia.

The patient suffered from double pus tubes. After making a median incision both tubes were found adherent to all surrounding structures. The mesentery and the lower part of the sigmoid were intimately fused with the pus tubes, and in getting out the tubes the mesentery was so badly injured near its insertion into the sigmoid that the bowel was resected. Owing to the deep position of the bowel, the impossibility of delivering it into the wound, and the extensive raw surface, it was feared that sutures could not be properly inserted, so after resecting about two inches of the intestine the ends were joined by a Murphy button. The wound was closed, the spincter ani dilated, and a rubber tube inserted through the anus to the button. The patient made an uneventful recovery.

CASE X.—Miss A., white, aged twenty-two years. Admitted to the hospital May 10, 1907; discharged June 28, 1907; anesthetic, ether. Referred by Dr. C. A. Blanton, of Richmond, Virginia.

The patient was operated on May 13 for right pyosalpinx. The right tube was filled with pus and numerous adhesions were found. At one point it had adhered to a loop of small intestine, which was greatly infiltrated. It seemed that an abscess had probably communicated with the intestine here. In removing the tube the lumen of the intestine at this point

was opened for a distance of one inch and one-half. Infiltration of the intestine and mesentery with inflammatory products made accurate approximation with sutures impossible, so about four inches of the bowel were resected and the ends united by a right angle suture penetrating all coats after the method described. Vomiting continued for some days, and was only controlled by stomach lavage. About five days later the abdominal wound, which had been closed with catgut, burst open. The patient was taken to the operating room, and the pelvis gently explored through the incision. A small accumulation of odorless sero-pus was discovered on the right side of the pelvis in the region from which the tube had been removed. A drainage tube was put into this point and the abdomen closed. There was a discharge of thin serum for a few days, which gradually decreased. There was no leakage at the site of the intestinal resection. The symptoms were evidently due to local peritonitis in that part of the pelvis from which the tube had been removed. More than a year after the operation the patient was in good condition and had gained in weight. There were no symptoms of obstruction nor any abdominal pain.

The seventh group comprises one case, tuberculosis of the cecum, with no death.

Case XI.—Mrs. P. O. R., white, aged twenty-eight years. Admitted to the hospital February 17, 1908; discharged March 4, 1908; anesthetic, ether. Referred by Dr. T. B. Henderson of Wakefield, Virginia.

Family history negative. No tuberculosis in the family. The patient has never been strong. She first complained of indigestion and pain in the right side. These attacks recurred irregularly, and were often accompanied by vomiting and some distention. After the bowels moved the attacks rapidly subsided. On palpation a small indefinite mass was found in the right iliac fossa. A diagnosis of recurrent appendicitis was made and the patient operated on through a McBurney incision on February 19, 1908. The cecum was hard and

much thickened. The pathological process had involved the base of the appendix, though its tip was not affected. The diseased cecum, together with the adjoining mesentery and mesenteric glands, was excised. The affected intestine was so thoroughly involved that the anatomical landmarks of the cecum had been entirely destroyed. The ileum for several feet above the obstruction was markedly hypertrophied from the effort to overcome the gradually increasing obstruction. An end-to-end union was made by suturing the ileum to the ascending colon. On account of the thickness of the ileum and the irregular contour of the bowel ends a double row of sutures was used. The patient made an uneventful recovery. A sinus, which resulted from the gauze drain, gradually closed. The patient when last heard from (about six months after the operation) was in excellent condition. A full report of this case, with a review of the literature on tuberculosis of the cecum, has been written by my assistant, Dr. R. O. Rogers, and appeared in *Surgery, Gynecology, and Obstetrics.*

OBSTRUCTION OF THE BOWELS.

By T. C. Witherspoon, M.D.,
Butte, Montana.

I shall present in this paper my experiences in the treatment of this interesting condition and not attempt a rehash of the literature. The special anatomy and pathology will be referred to only in so far as they directly bear upon its treatment.

Too often, only the postmortem, or illy-advised long search upon the operating table, reveals the true state of affairs. Theoretically, a distinctly exhaustive classification of bowel obstruction is helpful in arriving at a diagnosis of the cause or position of the lesion, but, in turn, this very knowledge is an incentive to proceed at length with the operation. To the more practical and satisfactory side of the problem: "How shall we deal with the obstruction to get the patient well?" will I invite your attention.

I know of few conditions which bring to the doctor such responsibility as this, and it is the one above all others wherein an exact conception of the practical is needed to reduce a fearful mortality. Upon prompt and well directed action, must success depend. The attitude of inaction, known too often as conservatism, is fatal. I have endeavored, for some years, to devise a uniform method of treating these patients which might limit handling in the operating room and shorten the time of surgical procedures. There are a certain number of these patients who offer clear indications as to what is necessary, but a large number present to the mind of the

operator doubtful indications as to what is most expedient. One can always eviscerate the abdomen and thereby fully determine the position and character of the obstruction and at the same time relieve the purely mechanical difficulty, but this entails an increased mortality. Is there not a satisfactory method short of a too radical procedure which might materially increase the number of recoveries?

I will call attention to my successes and my failures and try to point through these my present attitude in the treatment of recognized bowel obstruction.

I have grouped my cases as follows:

	No.	Deaths.
Toxic, potential obstruction	7	1
Inguinal hernia, strangulated in situ	4	
Inguinal hernia, strangulated, reduced en masse	3	
Femoral hernia, strangulated, in situ	4	1
Femoral hernia, strangulated, reduced en masse	1	1
Umbilical hernia, strangulated	2	
Invagination in children	4	1
Invagination in adult	1	1
Cecal cancer, invaginated	1	1
Cecal tuberculosis, acute obstruction	1	
Cancer, hepatic flexure of the colon with acute obstruction	1	1
Appendix surrounding jejunum	1	
Appendix abscess with adhesions to wall of pelvis	5	1
Meckel's diverticulum, causing acute obstruction	1	
Sigmoid ulcer with acute obstruction	1	

It will be observed I have followed no general classification in grouping these cases, but placed them under different headings determined by the "cause of the obstruction." They are cases of which I have a record and number thirty-seven in all.

The toxic cases are those upon whom I operated and proved the absence of organic lesion; the diagnosis, in the others, were all proved upon the operating table. There were 7 deaths in the 37 cases, giving approximately, 19 per cent.

mortality. The mortality in the individual groups is seen by reference to the table.

I have not included the cases of so-called postoperative or traumatic gastromesenteric ileus. These cases alone would require a paper to discuss them and their management.

In many of the cases the diagnosis of the obstructing agent was made before the operation, but in a fair number, this was impossible. The most puzzling problems were offered by the cases I have put under the heading of "toxic" obstruction. In those of hernias reduced "en masse," the physical signs were not sufficient to make an exact diagnosis before operation, though the history pointed strongly to the probability of the true condition.

In the cases of invagination, the diagnosis was made in each instance prior to the operation. The cancerous and tuberculous cases presented a mass which directed the route of operation, though the exact pathology of the trouble was only made clear upon operating.

In obstruction from the encircling appendix and from the Meckel's diverticulum, the diagnosis was not made until the abdomen was opened in each instance, and in one case, in which the bowel was kinked and adherent to the pelvic fascia in the environs of an appendiceal abscess, the obstructing cause was not ascertained until laparotomy was done for relief of the obstruction.

Under the head of the toxic obstruction, I wish to say a few words about "fecal obstruction." This is perhaps a text-book expression which has had more to do with causing a high mortality rate than has any other adverse factor in connection with the subject of bowel obstruction. It has not been my fortune to be called as consultant in an obstructed bowel case in which the obstructing cause was not patent, but that I had to face the question of fecal impaction. The inadvisability of too early or too rash surgical measures, until the entire list of cathartics and enemas have been given a trial in order to remove a supposedly obstructing mass of fecal

substance, is always insisted upon, and no amount of argument against these seems to avail, until the condition of the patient is decidedly bad.

In my list of cases, I have failed to discover one which I could look upon as a bona fide case of fecal impaction of the cecum or small bowels, pure and simple. In fact, I do not think I have ever seen a simple fecal impaction, except in the rectum and lower sigmoid. This latter is an occasional condition with which we meet and in no way offers serious difficulty to diagnosis or treatment. That hardened masses in the lower bowel usually cause the symptoms of obstruction, is contradicted by the hundreds who go from several days to weeks without a bowel movement and still suffer no greater inconvenience than headaches, backaches, bloating, and abdominal discomfort, and lack of appetite with coated tongues. If we could rob our text-books of this expression, I am convinced we could reduce the mortality in these cases at least 10 per cent. or more. It would help to do away with procrastination and harmful efforts at purging.

The one death I had from toxic obstruction was unquestionably due to operative measures carried too far. The patient, a man in middle life, had upon two former occasions, suffered from the initial symptoms of obstruction, but had been relieved by a simple cathartic. In his last attack the symptoms came after a dietary indiscretion. There were at first pain and bloating. The pain was sharp and crampy and referred more or less to the entire abdomen. The bloating was described as a feeling of fulness. Vomiting began on the second day and continued until death, following the operation. When I first saw him on the third or fourth day, his temperature was 99° +, his pulse fair, and his general condition moderately good. He was vomiting frequently a dark, fecal-smelling liquid and no effort to move the bowels had been successful. The pain had largely gone when I saw him, though he was generally tender over the abdomen. The meteorism was general and pronounced. He consented to an

operation for relief. A median incision revealed an enormously dilated cecum, ascending and transverse colon filling the abdomen; but a contracted sigmoid. The small bowels were empty. Thinking that I had a splenic flexure obstruction I enlarged the incision and allowed the dilated colon to escape in order that I might more readily reach the involved portion of bowel. As the dilated bowel passed out of the wound, there was a loud report which proved to be due to the rupture of its peritoneal coat. I immediately introduced a trocar and cannula and removed the distending gases and liquid. Examination revealed no mechanically obstructing agent. An appendicostomy was performed through a right-side puncture for the purpose of draining the colon. The peritoneal rent was sutured and the abdomen closed. The patient died during the second day. A postmortem failed to show a single point of mechanical obstruction. The large bowels remained contracted, but the small were dilated with a gallon or more of liquid, and with some gas not in excessive quantity.

The most interesting feature of this case was the one of treatment. Had I performed appendicostomy immediately without allowing an escape of bowel and had I rested content with a simple digital exploration of the descending colon, my patient would, in all likelihood, have recovered. The dilation of the colon indicated that is was proximal to an obstruction and a simple drain of this bowel would have put the patient in the best possible condition for operation later, had the obstruction continued.

Two interesting points are raised by the findings: (1) The vomiting must bave been due to an antiperistalsis and not to an overflow backward, as described first by Hageunot, of Montpellier, or a "rückstoss," so called by Nothnagle. (2) The toxic obstruction was accompanied by an enormous gaseous distention; this, too, with sharp spasmodic pains, like that observed in mechanical obstruction. As the patient was not allowed to drink after operation, the fluid in the small bowels found on postmortem must have been due to

secretion or acute transudation, the result of the trauma of the operation.

Another of the toxic cases offered some intersting evidence in respect to treatment. The child, a girl, aged six years, began to suffer with crampy abdominal pains which she referred to the umbilical region, and for twenty-four hours her parents, thinking she had eaten something which upset her, tried the usual home cathartics for relief. The following day a physician was called, who in turn made every effort to move the bowels. He found the child suffering from sharp, colicy pains and vomiting. The next morning, seeing that the general condition was unimproved, even not so good as the day previous, he came for me to see the patient in consultation with him. I found the child still suffering, slightly bloated without local meteorism, vomiting, no stooling, no temperature, pulse 120, and no definable local tenderness, but a diffuse soreness. I advised immediate operation, which induced the calling of a third consultant. It was then agreed by two of our number that still further effort be made to move the bowels by enemas, in hope an impacted fecal mass might be washed away. The same evening I was called in again to find the only change from the condition noted in the morning, was a pulse of 148. Again, I asked to be allowed to operate and this time, backed by the two consultants, the parents consented. A right rectus incision was made, suspecting an appendix adhesion was probably the cause of the obstruction. No apparent obstruction was found, but instead, a mild catarrhal appendicitis, the appendix looking almost normal The glands about the meso-appendix were enlarged and the appendix base slightly constricted. The appendix was removed and the finger used to search the abdomen for further trouble. As nothing was found, the wound was closed Following the operation, the child grew better rapidly; the bowels opened on the second day. Improvement continued until the end of the week, when her pulse was in the eighties. Suddenly the bowel movement ceased, meteorism became

marked, and the pulse rose to 150. Vomiting began and the condition looked critical. It was evident that there was a return of the obstructed condition and suspecting mischief near the appendix stump, I opened the abdomen by a criss-cross incision.

Upon incising the peritoneum, a moderate amount of seropurulent fluid escaped. Some of this was caught and given to the pathologist for culture and staining. A suprapubic puncture was made and a glass tube introduced into the bottom of the pelvis. Through this, two or three ounces of the same fluid escaped. Next, the appendix area was examined and found to be in perfect shape. Knowing the utility of a drain of the bowels in these cases, I attached a distended loop of ileum to the wall at the point of the criss-cross opening and packed the wound. The child was returned to bed and placed in a good Fowler position. Next morning, the condition was about the same, so I removed the pack and opened the bowel. A quantity of gas and liquid escaped. In short order, improvement began. The pathologist had reported, in the meantime, that the fluid removed from the peritoneal cavity was sterile. In five days, the bowels opened through and through and the child made a nice recovery.

It might be argued that the original condition was reflex from the appendix, but the findings were against this, especially at the second operation. The only explanation I can offer was an inhibitory intoxication. In this case no bowel exposure was allowed and all work was performed as rapidly as possible. There was, at the first operation, a very strong desire to carefully examine each portion of gut under vision. This, I feel, would have been a fatal error. My previous experiences taught me to exercise considerable care in exposing bowels which are obstructed.

The danger of a simple rectal injection to move the bowels was illustrated by one of the toxic cases. A physician was called to see a middle-aged woman suffering from bowel obstruction and immediately proceeded to wash out the large

bowel by enemas. The patient was placed in a knee-chest position and a large injection given. She began shortly to vomit a quantity of fecal-smelling fluid. The bowels, however, remained inactive and the enema did not return. She was brought to me at the hospital and an abdominal incision revealed a very large colon full of water, sagging into the pelvis. An appendicostomy was performed and a quantity of liquid, fecal in odor and color, escaped through a catheter which was introduced through the appendix into the cecum. She made an uninterrupted recovery. As a gallon or more of water was used in the rectal injection, none of which returned, and as the vomiting, which began immediately after its use was fecal, it is most probable that the water was transmitted to the stomach and vomited.

There is no reason to believe a dilated cecum, with inactive coats, might not allow a back flow of fluid through the ileocecal valve. The experiments of Hess are conclusive as to the possibility of the small bowels acting in a reverse manner. He, it will be remembered, reversed the direction of a large portion of small bowel in a lower animal and after the healing, food taken by mouth was passed into the rectum and expelled.

In these cases of toxic obstruction, it would seem that the large bowel is first at fault and a cecal drain has in my experience, been very effective in relieving the condition. That the small bowel may, in like manner, become inactive, following the trauma of an extensive operation, is shown by the first case I recorded, in which an appendicostomy, draining, and emptying the big bowel, failed to bring relief.

In cases of inactive colon, any water injected per rectum only adds fuel to the fire by filling the gut with a fluid which it does not expel. This carries the dilated transverse colon into the pelvis, thereby materially impeding the outflow, sharply bending it at the splenic and hepatic flexures, which portions are fixed.

Strangulated hernias offered better indications for their handling. When the patient's condition is good, there is no

reason a resection may not be done, but when bad, nothing is as salutary as draining the bowels through the herniated dead gut. A secondary resection may be done when the fecal absorption and intoxication are relieved. There are times, however, when there is doubt as to the viability of the gut. In four of my earlier cases, (three femoral hernias in women and one inguinal hernia in a man) there was a question as to the condition of the gut.

In these the darkened portion of bowel was returned to the abdominal cavity. All made a nice recovery. Lately I followed a procedure which is recognized as applicable in these conditions with a fatal termination. The patient, a healthy man in middle life, was brought to the hospital suffering from symptoms of obstruction which had existed four days. Examination revealed a small lump in the right femoral region which gave him no discomfort. The symptoms were classically those of obstruction. I made an incision over the lump and found a small knuckle of dark gut in the femoral canal. During the manipulation to free the sac, the knuckle slipped back into the abdominal cavity. I then made a low mid-rectus incision and found the altered section of gut. A portion about the size of a quarter of a dollar was quite dark, and this I invaginated bringing healthy bowel serose into contact over it. A drain was introduced through the femoral canal to the peritoneum and the abdominal incision closed. For two days the patient did well, had free bowel evacuations several times and seemed to be progressing normally. The third day bloating began, he went from bad to worse and died on the seventh day. A postmortem showed four feet of gangrenous gut. This condition can only be explained by supposing the phlebitis extended from the original gangrenous area into the mesentery and progressively involved the gut supplied by the neighboring bloodvessels. I am satisfied, had I removed the small section of involved gut at the time of operation, the patient would have recovered. I call especial attention to this case, as I recently read an excellent article by Dr. Summers,

of Omaha, recommending this procedure in like cases. There are, it seems to me, but two courses for the operator when dealing with dead or seriously questionable portions of bowel; either reduce the knuckle into the wound, fix it there and drain by opening it, or resect at once. The patient's general condition will decide the proper course to pursue.

One of my cases of hernia which I opened "in situ," as suggested, died, however, not as a direct result of the operation but by drowning in his vomitus. I operated with the head high and cautioned the nurse to put him in the Fowler position in bed. This order was violated and as he recovered from the anesthetic, he began to vomit. His head being low, a rapid escape of liquid from the stomach occurred which he inhaled. I was recalled to his room and pumped fully a quart of fecal fluid from his lungs. His condition was extremely bad before this complication and it was impossible to resuscitate him. Attention has been called to this drowning by a number of writers and it needs no further comment.

In one of the hernial obstructions, I found the appendix and cecum. The cecum was in a fairly good condition, so I removed the appendix and reduced the hernia. Recovery was prompt.

One of the most difficult cases of the whole series, was an invagination of the ileocecal junction up the colon, in an adult. This was some days old and could not be reduced. I finally resorted to a resection and the patient died following the operation. Resection was made difficult by a mass of unreducible bowel within the colon. This I removed by the method of Maunsell. I believe after my experience with that case, the wiser method of resection is to reduce as far as possible and clamp the bowel above and below the mass, taking the whole portion away. It is an error to try to save the segment of gut which surrounds the invaginated portion. The mesentery makes a difficult structure to handle when the portion of invaginated gut is rather long. The difficulty lies in avoiding injury to the mesentery supplying blood to

the gut which is uninvaginated and should be saved. Those who have had to deal with like cases will recall the fact that the mesentery is drawn in with the invaginating gut almost to its base.

In the case of invagination of the ileocecal cancer, the reduction was easily accomplished and resection presented no difficulty.

One of the most remarkable and instructive cases of these I record was one in which an inflamed appendix was found thrown over the jejunum and attached to the side of the jejunum mesentery. The young man had been suffering from obstruction one week when he came to me.

The attack commenced with a feeling of abdominal weight accompanied by crampy pains. A day or so prior to this, he had had a fall from his buggy and as he ascribed his symptoms of being sore to the accident he took some cathartic to open the bowels. This produced no result so he sought the aid of his physician. A diagnosis of either ptomaine poisoning or fecal obstruction was made. Efforts made to move the bowels were unavailing. Four days after the onset of the trouble he began to vomit a dark fluid. I saw him on the seventh day of the attack. His pulse was strangely good, beating less than 100, and his temperature was 99°, and a small fraction. His abdomen was somewhat rigid but not to a degree observed in acute inflammatory processes, the stomach was moderately distended, the small bowels gave no evidence of much gaseous distention. Local tenderness could perhaps be said to be greatest about the lower right side of the abdomen, but this was not marked. Auscultation revealed some high and some low pitched bowel peristaltic sounds, no tumor could be discovered and no symptoms to direct the operative route. His bowels being still inactive and the vomitus being fecal, I advised operation, to which the patient consented. On opening the abdomen, a most interesting picture presented. The ileum and portion of jejunum were contracted to half their normal size and were of the color of

slate. The big bowel was normal in appearance, containing some gas. There was no excess of fluid in the peritoneal cavity. My finger easily detected a band stretched across the small bowel extending toward the appendix. The band proved to be the appendix bound in this position by having its tip tightly adherent to the side of the jejunal mesentery. The pressure from this appendiceal band obstructed the circulation in over one-half of the mesentery. I immediately broke up the adhesion and freed the appendix. The intestinal fluid began at once to pass on into the formerly obstructed bowel. In a very few moments, absorption of the toxic principles of these fluids caused the pulse to jump to 160. I removed the appendix and because of his bad condition, closed the abdomen without waiting to see how the circulation was reëstablishing itself in the bowel coat. The patient made a steady and uneventful recovery.

This case offered no symptoms which would have made a pre-operative diagnosis possible. The fecal vomiting came from well up the jejunum and the abdomen, instead of being distended, was almost normal in measurement. The bowel proximal to the obstruction was full of fluid, but contained no gas. There was evident peristalsis as ascertained by auscultation but no fecal movement had occurred for a week. The operation was done because of the continued vomiting and the impossibility to move the bowels. I expected simply to drain proximal to an inactive or obstructed portion of bowel. The operation was made more extensive by the necessary removal of the inflamed appendix. The rapid rise in the pulse, while alarming to a degree, was at least assuring of the return of circulation to the bowel coat and of the faculty of absorption. It was interesting to note with what wonderful rapidity the pulse went from the nineties to 160. I can account for the absolutely contracted condition of the small bowel in the area of obstructed circulation. The occlusion really occurred at the jejunum, while the circulation was interferred with in the mesentery from the point of adhesion

to the base of the appendix. The ileum being open distally, the venous blood superinduced tonic contractions of its muscle coats, which emptied it. The color of the ileum suggested a long loop obstruction but its empty condition indicated, at most, only a partial occlusion at its distal end.

The case of obstruction arising from the adherent and constricting Meckel's diverticulum required a resection of four and one-half feet of gangrenous jejunum. The abdomen was full of foul-smelling bloody fluid. The gangrenous loop was distended with fluid and some little gas. Immediately upon opening the abdomen, the black bowel was brought through the wound and the living bowel packed back with large guaze sponges. Very little shock followed the resection and end-to-end anastomosis with a Murphy button. The introduction of a glass tube into the bottom of the cul de sac of Douglas and a good Fowler position in bed, enabled the patient to recover.

The dangers of postoperative adhesion of the small bowel to the lateral pelvic wall when drainage is applied along it, was illustrated by three cases in my list, with one death. Two of the cases recovered after an ileocolic anastomosis. In another paper I wish to call attention to this danger of applying drainage from out the pelvic cavity along its lateral walls. The small bowels adhere to the immobile wall and this forms a very favorable condition for obstruction.

After reflecting upon the results I obtained in these cases of bowel obstruction, I am prepared to go to less extreme measures to bring about relief than formerly. I believe most of us are inclined to look too much at the mechanical side of the problem to the neglect of the physiological. Even in strangulation by a hernial ring, the lumen of the bowel loop caught in the hernia does not suffer from complete closure, but rather is there a vascular obstruction. The bowel shut off is as complete when its coat dies from a thrombotic process as when caught in a hernial ring. The real obstruction is one of function and not of pure mechanics. The danger

to the patient arises from toxic absorption proximal to the infunctionate segment. With this in view, I have formulated for myself the cardinal principle of bowel drain. The method of obtaining this may vary as the conditions vary, but it is the part of wisdom never to tax the patient's strength by long procedures, except in the few instances like the Meckel's diverticulum strangulation related above. If the condition is due to a band, invagination, hernia, etc., which admit of easy remedyings, apply the method, but if the case is one of uncertainty or one which necessitates an exhaustive and dangerous procedure it is always better to let out the proximal bowel contents by an artificial opening, until the general toxic state is much improved, when a more radical measure might be adopted to bring permanent relief. Inflammatory obstructions clear up beautifully when the loop proximal to the involved segment is drained.

Neoplastic or granulomatious processes may be readily handled after sufficient drainage is given the bowel above the lesion. The danger lies in attempting a complete procedure at the one time. Why should one attempt to resect the bowel in a desperately ill patient when a strangulated hernia exists? A simple local anesthetic opening will suffice to bring about relief from sufferings, physical and toxic. In a week the anastomosis becomes a matter of simple surgery. In one of my patients, a child, aged twelve years, obstruction become complete nearly three weeks after an operation for general peritonitis. I opened the abdomen only to find a conglomeration of bowel loops which to unravel would have probably caused death. I selected a portion of bowel which, because of its distention, was recognized as proximal to the obstruction and which, at the same time, seemed to be the most distal distended loop from the stomach. This was drained through a large rubber tube. In less than two weeks the fecal movements were passing again by the natural route and the artificial opening was allowed to close. To this day, I am unaware of the exact position or nature of the obstruction,

though I surmise it was due to an inflammatory process in the neighborhood of the inflamed appendix, which organ initiated the primary disturbance.

Again, let me say of the treatment for obstruction, I believe success lies in seeking to drain rather than seeking to unravel the mechanical difficulty. When this latter can be done without adding a material chance of mortality, it is wise to adopt the measure, but when we must add to the danger of the condition by so doing, simply drain artificially. At a later time a serious condition will have become simple.

DISCUSSION ON THE PAPERS OF DRS. HORSLEY AND WITHERSPOON.

Dr. John Young Brown, of St. Louis.—I was very much interested in the paper presented by Dr. Horsley, and I would like to discuss that phase of it which deals with the treatment of gangrenous and obstructive lesions necessitating intestinal resection. The mere mechanics of intestinal resection are so thoroughly understood as to admit of very little discussion. It seems to me that it is immaterial what method is selected, so long as the resection is made well back into healthy bowel, giving us healthy tissue to approximate.

In our zeal to develop a perfect technique at the site of operation, or to modify an already satisfactory method, it occurs to me that we have lost sight of one of the most important elements in cases of this character, namely, the toxemias. In many of these cases a perfect resection may be done, but failure to properly look after the toxic element in the case, results disastrously. Such cases die even after a perfect operation. In order to combat properly the sequences of obstruction, it is necessary to begin our work not only before, but during and following operation. It was our invariable custom at the City Hospital of St. Louis, in all cases of obstruction, particularly obstruction due to gangrenous hernia, to begin the treatment of the case prior to operation by a careful stomach washing. We know that in all such cases the bowel above the point of constric-

tion is distended; there is retrograde peristalsis, and the stomach is frequently filled with fecal matter, and unless properly cleansed, many of these patients will die from fecal drowning during anesthesia or from absorption of this toxic material. These cases have to be handled quickly, and the method we have used, has for its purpose, rapidity of operating as well as draining the distended bowel above the constriction, as I described some years ago at a meeting of the American Association of Obstetricians and Gynecologists, held in New York City. The method consists simply in clamping the distended bowel above the constriction, cutting immediately across the bowel, and tying into the proximal end of the gut a glass drain, to which is attached a rubber drain leading down to a basin. While the mesentery of the segment to be removed is being tied off, the bowel above is drained. It is astonishing how much gas and fecal matter will pass out through a tube of this kind during the process of operation. By this technique we lose no time, and when the mesentery has been properly dealt with, the anastomosis can be made either by suture or by the Murphy button. After the operation is completed, we have invariably made it a practice to re-wash the stomach before the patient is taken off the table, and then to institute immediately the Murphy saline treatment.

Dr. Major G. Seelig, of St. Louis, Mo.—During the last half of the present decade one of the most important and interesting developments of abdominal work has been done along the line of peritonitis, both clinical and experimental, and this development has some bearing on the subject under discussion in so far as peritonitis frequently leads to postoperative ileus. Furthermore, another line of investigation has been that of gastromesenteric ileus, a form of intestinal obstruction due to kinking of, or pressure upon the duodenum, most frequently at the root of the mesentery.

Although both of these advances have been modern, it is rather strange that they have not been correlated. Gastromesenteric ileus, or acute dilatation of the stomach, as it is frequently called, is an obscure clinical entity and yet it is fairly commonly agreed upon that in the majority of cases the duodenal obstruction results from the fact that the intestines are dragged down and incarcerated in the pelvis. This pelvic incarceration causes traction on the root of the

mesentery, resulting in compression of the duodenum. It has been my unfortunate experience to have cases, which simulated postoperative obstruction, turn out to be instances of acute dilatation of the stomach. If, as stated, the fact is true, that traction on the mesentery causes duodenal obstruction, we would naturally expect that a life-saving measure, the sitting posture, after operations for peritonitis, would be a measure which would rather predispose toward traction on the mesentery, by causing the small intestines to gravitate into the pelvis. Within the last two weeks I have encountered the clinical misfortune of acute dilation of the stomach in a patient, placed in Fowler's position, after operation for acute peritonitis. The diagnosis of acute dilatation of the stomach is always difficult, even in the uncomplicated cases, because it is almost impossible to differentiate it from acute peritonitis, but when it comes as a complication to a peritonitis it is well nigh impossible to say whether the peritonitic process is continuing, or whether there has been engrafted upon it gastro-mesenteric ileus. Here it is a dilemma both horns of which are decidedly pointed and dangerous because in a peritonitis the patient's head should be high and his pelvis low, whereas the rational treatment for acute dilatation of the stomach lies in attempting to release the intestines from the pelvis by placing the head low and the pelvis high.

Dr. Horace J. Whitacre, of Cincinnati, Ohio.—I feel that the paper of Dr. Horsley is most valuable, although my experience has been so much more along the line of the most estimable paper of Dr. Witherspoon, that I wish to speak particularly regarding it. His paper appeals to me particularly because of the number of cases of this sort that have come to my attention, namely, the bad cases of intestinal obstruction; the late cases which have been fed everything from mild cathartics to croton oil. These cases come to the hospital in a serious condition; they cannot withstand an operation of any gravity, and I have followed pratically the same plan of treatment as that advocated by Dr. Witherspoon. It has been my practice to promptly give these patients a submammary or subcutaneous infusion of salt solution in large amount, and salt solution by rectum, then the subsequent course will depend largely upon the

strength of the patient. A large percentage of these operations are done under cocaine anesthesia. When possible I open the abdomen under cocaine anesthesia, supplemented sometimes by a mild ether anesthesia, sufficient to get through the wall and make a hasty inspection, which I may say, is a search for gangrene only. If a gangrenous loop of bowel is found, it is drawn out, a tube is tied in each end and the operation is ended. If no gangrene is found, put an enterostomy tube in the first loop of distended bowel encountered and drain. Limit the procedure to ten or twenty minutes, and get the patient off the table. A second submammary infusion is given during the operation. A large percentage of these patients have recovered, and have soon been in good condition for a more extensive operation for the relief of the cause of the obstruction and for the closure of the enterostomy wound in the gut. These patients stand a secondary operation remarkably well. The peritoneum seems to develop an immunity.

I should like to speak for a moment regarding the efficiency of the same method in cases of appendicitis that come in with a terribly bad, advanced, general peritonitis, in which there is a large amount of pus, in which a hasty cocaine or nitrous oxide anesthesia enables one to liberate the pus, but we fail to control the vomiting which is present and the distention which is progressive. I believe that an enterostomy done under cocaine anesthesia will save a large percentage of these cases. It is remarkably efficient.

Dr. Herman Tuholske, of St. Louis, Mo.—I desire to say a few words on the subject of intestinal obstruction, which is always a matter of great interest, because it seems to occupy a position *sui generis* in surgical diagnostics. Perhaps in most cases the surgeon, when he deals with a case of intestinal obstruction, feels that he must hurry. He must be doing, because the chances are that the patient has already been under some form of tentative treatment without diagnosis. If there is any time in his surgical diagnostics when the doctor is not to hurry, it is when he gets a case of intestinal obstruction. It is a time when he should sit down, take half an hour or even an hour, and try to determine the cause of the obstruction, and when a careful examination is made in the majority of cases, a diagnosis can be arrived at, if not absolutely topical, at any rate as

to its character. Peritonitis plays an important part, but there are two classes which stand out widely and which are utterly distinct from each other. One class in which the obstruction of the bowel is due to obturation of the lumen; in which the obstruction is due to peritoneal involvement adjacent to the mesentery. There is a vast difference in the clinical picture of a case of obstruction that occurs when the mesentery is involved, in which there is a twist of the gut, or an intussusception where the mesentery is implicated. Unless these two conditions are considered apart from each other in the beginning, the surgeon will go wrong. We know from the pathology of intestinal obstruction what sections of gut are specially liable to certain things. We know that chronic obstruction and acute obstruction of the bowel, unless held effectually apart in the beginning, may both exist at the time the patient is brought to us. An acute condition may be grafted upon a chronic obstruction. We need to watch and to search for the cause of the chronic obstruction. We must make a diagnosis as to whether or not the mesentery is involved. Some time ago, in referring to a case of Dr. Seelig's, a diagnosis of dilatation of the stomach was clearly made instead of obstruction of the bowel, and relief was afforded by gastric lavage, etc.

In thrombosis of the mesenteric vessels, resulting in cutting off the circulation, a section of the gut undergoes gangrene within a short time; nevertheless one can make a diagnosis in the majority of these cases, provided one is not in haste. If there is any time when one needs to do a little thinking, it is when one has a case of intestinal obstruction, when one should sit down and make a diagnosis, and the most important thing, unquestionably, in obstruction of the bowel, is the diagnosis which, in the majority of cases, can be made. I have examined many of this class of patients, and I say to you that in the majority of instances the cause can be determined. Then comes legitimate surgery, and then we will be able to tell whether to make an exploratory incision under cocaine anesthesia or not. Anyone who has seen many cases of obstruction of the bowel, where the intestines are all puffed up, knows what an incision under cocaine anesthesia will do. You find the belly full of inflated gut, the intestines protrude; you cannot get them back, and you handle them until it is necessary to puncture them, to reduce

them into the cavity. After the distention has occurred, you cannot successfully perform the operation and relieve the cause; you can cut and drain; that is legitimate. But no search is legitimate unless a diagnosis has been made, and that diagnosis in the great majority of cases can be made if the case is carefully studied.

As to the details for relief of one form of obstruction and another, the man of experience will know whether he can perform a radical operation at the time or relieve the condition and put the patient in condition to undergo a radical operation subsequently. The whole thing turns on a reasonably safe and accurate diagnosis, and a careful study of the case. I have seen these patients have their stomach washed out, but this cannot be done with any great degree of satisfaction. About three weeks ago a patient was brought to the Jewish hospital. He had a distended abdomen. After getting a history of the case, I sent for the doctor who had treated him. The patient was taken into the preparing room. We intended emptying his stomach, we put him on the table, and before a tube was successfully introduced, he was drowned on the table by the regurgitation of the foul and immense quantity of fluid that came out of his stomach, flooded the larynx before we could make a diagnosis. I believe the stomach should be washed out in these cases the first thing, when there is a thought of symptoms of obstruction. In brief, it is a question of diagnosis, first, last, and all the time.

Dr. R. C. Coffey, of Portland, Oregon.—In line with Dr. Witherspoon's remarks, I would like to ask if there is such a thing as a surgical fecal impaction *per se*. I do a considerable amount of intestinal surgery, but so far as I know fecal impaction is a theoretical proposition, unless it is backed up by some form of obstruction elsewhere.

Dr. Horsley (closing the discussion on his part).—The remarks made by Dr. Brown apply more particularly to the paper of Dr. Witherspoon, as my paper merely dealt with resection and analysis of cases. Whenever there is obstruction of the bowel, it is a question for the surgeon to decide whether enterostomy is indicated, or whether resection should be done at the time. In my opinion, no hard and fast rule can be laid down. If any reasonable doubt exists,

I would rather do enterostomy first, and resection of the intestine later, if it proves necessary.

Dr. Witherspoon (closing).—As I said, when I began to read my paper, I only mentioned a few points of interest; but I cannot resist the temptation to say a word or two regarding some of the things that have been discussed. I agree with Dr. Tuholske that it is very essential to make a diagnosis, but he can doubtless see further than I can. I must confess that in a certain percentage of the cases we can do this, particularly in a man with a large inguinal or umbilical hernia or in a woman suffering from a strangulated femoral hernia. In such cases we do not have trouble in making a diagnosis. The same is true of a child when it has a sausage-shaped abdominal tumor we can easily feel, with the symptoms so characteristic of invagination; we are not going to have much trouble in making a diagnosis. But it is to a certain class of cases where the diagnosis is exceedingly difficult that I refer, and where no man knows what is wrong until he gets inside the abdomen; even then he may not know what is wrong if he does the conservative thing. I believe that we should keep our fingers off as much as we can when we are not certain as to the exact nature of the condition we have to deal with, and the man who handles the bowel too much or pulls a lot of bowel out of the abdomen, will regret it. When the patient is not in good condition, I believe it is proper to drain the bowel as distally from the stomach as possible. Later, if necessary, you can do an operation which will clear up the difficulty.

There is a cause of obstruction of the bowel attended by the formation of an appendiceal abscess I wish to refer to. The surgeon who drains an abscess of the appendix over the brim of the pelvis, out of the pelvis proper, will sometimes have a loop of bowel become adherent to the lateral pelvic fascia or the peritoneum covering it and get obstruction at that point. In treating that form of obstruction, I have been fortunate in doing an ileocolostomy. In the course of time the original bowel obstruction opens up. It is not an actual obliteration of the intestinal lumen, but a physiological obliteration of function at that point, and the feces can not go through. There is kinking and inflammatory adhesion, and if the obstruction is relieved and thereby through drainage effected, a secondary operation is not

likely to be needed. These cases look critical, but simple drainage of the proximal loop of intestine, letting them alone otherwise, will in the course of time open the bowel.

The first thing noticed is the passage of a little coloring matter, then more and more, until a complete through-and-through movement of the bowel is obtained.

I must confess, again, that I cannot make a diagnosis in many cases, and until I can, I shall stick to drainage.

PENETRATING WOUNDS OF THE ABDOMEN.

By Floyd W. McRae, M.D.,
Atlanta, Georgia.

My apology for again bringing this subject to you for discussion is, that it is full of dramatic interest and pathetic tragedy. When the history of gunshot wounds of the abdomen shall have been written, chief credit must be given to Southern surgeons. Most of the papers on this subject that are really worth while, have been written by fellows of this Association, and have been printed in its Transactions.

We, of the South, are brought face to face with gunshot wounds of the abdomen far more frequently than are the surgeons of any other section or country. The conditions that have brought us these opportunities, with their care and great responsibilities, still obtain to a considerable degree. With our large negro population, the inherent racial antagonism that exists between the lower elements of both races and the prevalent, though limited practice of carrying concealed weapons, we must, for a indefinite period of time, continue to deal with these emergencies.

The diagnosis of penetration of the abdomen, in civil practice, cannot be made with even approximate accuracy without tracing the wound. Attempts to follow wounds with the finger or the probe frequently eventuate in failure—neither confirming nor disproving penetration. These are dangerous expedients—universally condemned by the best authorities.

According to the most reliable statistics recorded, in only 10 per cent. of the cases of penetrating abdominal wounds

do the hollow and solid viscera escape serious injury. There is but one positive sign of perforation—seen exceptionally—the escape of gas or feces externally. Shock is a very variable symptom, marked in nervous individuals, often practically absent in men of "iron nerve" in spite of grave lesions. When pronounced and persistent, it is strong presumptive evidence of free bleeding. Nausea, vomiting, and muscular tension are signs of value. (*The vomitus should be examined for blood. Blood in the stools is rarely observed early enough to be of diagnostic value as indicating perforation. The Senn hydrogen gas test has proved unreliable and dangerous; it is conclusive, not exclusive.*)

TREATMENT. In civil life, with fair hospital facilities, aseptic technique, and a competent surgeon available, almost every penetrating wound of the abdomen that does not prove immediately fatal on account of shock and hemorrhage should be dealt with by means of prompt operation. When everything is ready, the preparation of the patient should be made on the operating table during the administration of the anesthetic; the stomach should be washed out and the field of operation thoroughly prepared. If there is any doubt as to the penetration of the wound, it should be traced. By tracing is meant laying open the wound of entrance, the wound of exit and the intervening track of the bullet. Any one, or all three, may be necessary to prove or disaprove penetration of the peritoneal cavity beyond equivocation.

If the wound is penetrating, the operation should be so extended as to constitute an exploratory celiotomy; and if visceral damage is found, immediate repair should be made. Unless very inconveniently located, the wound of entrance should be enlarged sufficiently for thorough exploration. (When this is not advisable, a median incision, either above or below the umbilicus, should be made. The location of the incision should be determined by the history of the case—the position of the patient when hit by the bullet, the angle from which it was fired, and its probable course.)

On opening the abdomen, the escape of gas or feces should be noted and immediate search be made for the bleeding vessel or vessels, if there is profuse hemorrhage. Free bleeding should be arrested at once, and if essential to its accomplishment the incision should be enlarged and the patient partially or completely eviscerated. These extreme measures should be avoided if possible. Long incisions, evisceration, undue exposure of intestines and rough handling greatly increase the operative mortality.

The first portion of the intestine encountered should be brought out of the wound and a tape or a strip of gauze thrown around it by pushing one end through the mesentery, between vessels, with a hemostat. The ends of the tape or gauze are caught and held by forceps; a cross nick is made either above or below the tape to give a definite point of departure. This is a little procedure of great practical value, requiring only a few seconds of time in its accomplishment. To look for the ileocecal junction or some other readily recognizable portion of the intestinal tract is a waste of time, and the additional handling tends to spread infection in the presence of perforation with leakage. The whole intestinal tract should be rapidly examined, first above and next below the gauze. Slits in the mesentery should be repaired, bleeding be arrested and intestinal perforations be closed as found. When it can be done without too much contracture of the lumen of the gut, the perforation should be closed on its convex surface and in its longitudinal axis. Perforations near the mesenteric border usually can be closed best transversely. Less resistance is offered to the fecal flow by a longitudinal seam than by a transverse one, the dangers from leakage and obstruction are consequently lessened. Care should be taken to see that the mesentric vessels supplying the intestine are not interfered with. When the margins of the perforation are ragged and contused, they should be trimmed off. When the wound is small and clean cut, interrupted Lembert sutures are all that is necessary. When the perforation

is long and ragged, a few interrupted Czerny sutures should be inserted; over these Lembert sutures of celluloid linen (Pagenstecker) or silk should be placed to close the perforation accurately, care being taken not to infold too much tissue. The intestine in gunshot perforation is often in a state of spasmodic contraction. I have found this condition present in some portion of the alimentary canal in almost every case of gunshot wound that has come under my observation. This contraction, reducing the gut much below its normal caliber, enhances the danger of infolding too much tissue, the bite of the suture being six or eight times deeper than it would have been had the gut retained its normal degree of distention and relaxation.

When there is considerable separation of the gut from its mesentery, resection and end-to-end anastomosis should be done. It is frequently a question of judgment as to whether a large number of perforations close together should be sutured separately, or a resection of that portion of the intestine be resorted to. The latter is generally considered to be the better procedure, taking less time and diminishing the danger of obstruction. (When a resection is done the intestine should be cut across obliquely, so as to be sure that the mesentric border is a little longer than the convex border. The anastomosis can best be accomplished by continuous Czerny-Lembert sutures of Pagenstecker or silk, the mesenteric borders first being approximated accurately by the Maunsell mattress-mesenteric suture. The approximation of the cut ends is facilitated by interrupted sutures dividing the intestines into thirds, as suggested by Connell. Where haste is essential, the Murphy button may be used instead of sutures. (The intestine should be cleansed by moist sponging as the operation proceeds. If it is necessary to keep any considerable portion of the gut outside of the abdominal cavity for a length of time, it should be covered by pads or towels wrung out of warm normal salt solution, and it should be kept moist and warm by frequently wetting the gauze with warm

salt solution. This should be done by the assistant or the nurse.) Under ordinary conditions, only a small portion of the intestine need be withdrawn from the abdomen at a time; as the surgeon draws out and traces the intestine, his assistant follows after and replaces it in the abdominal cavity. After examining from the point of departure upward to the end of the gut or vice versa, the opposite portion of the intestine is drawn out by the strip of gauze around it and followed in the same way, as above described, dealing with each injury seriatim. The strip of gauze around the intestine is next removed and the wound in the mesentery closed.

Careful handling of the intestine, without undue exposure, is essential in order to secure good results. Evisceration, rough handling, and the long exposure of intestine have turned the scales in many of these abdominal injuries, and led to a fatal result. (Many of the deaths occurring seven to ten days after operation done for penetrating wounds of the abdomen, are due to perforation caused by sloughing of the intestine, owing to separation from its mesentery. It must ever be borne in mind that a gut separated from its mesenteric blood supply cannot live.)

Note should always be taken of the presence or the absence of urine in the peritoneal cavity, and the bladder should be examined for injury. If the bladder has been perforated, it should be sutured accurately by interrupted sutures of catgut, which embrace all the coats down to the mucous membrane. If the suture line cannot be tested by distending the bladder, a catheter should be introduced or drainage be obtained through a perineal incision. I prefer continuous catheterization through the urethra to making a perineal section. In these days of clean surgery and skilful nursing, one need have little apprehension that the catheter, when properly handled, will cause chills or produce urethral irritation.

In one of my cases the bladder was tunnelled for two inches, but other than the time required in making the repair, it did not seem to complicate matters in the least. Two of

the fatal cases, in the Grady Hospital statistics, quoted below, were due to failure to find and properly deal with bladder injuries.

Injuries to the solid viscera other than the kidney and pancreas are dangerous chiefly on account of hemorrhage.

Bleeding from the liver can usually be controlled by light gauze packing. When this does not suffice, deep through-and-through, heavy catgut sutures loosely tied, or the tape suture of Tiffany, may be necessary. (Injuries to the pancreas are very difficult to handle properly, and, consequently, they are peculiarly fatal. When the pancreas has been injured, the wound in it should be packed and both anterior and posterior drainage should be made.

Superficial injuries to the cortical substance of the kidney should be drained through the loin. It is dangerous to attempt to drain a kidney transperitoneally. When there is extensive laceration of the kidney substance, and when the renal vessels are severed, a nephrectomy should be done. Temporizing with a kidney thus injured will usually lead to a fatal result.

Of first importance in the after-treatment of penetrating wounds of the abdomen is rest, general and alimentary. When the injury is in the upper portion of the intestinal tract, nothing should be allowed by the mouth except sterile water for several days. The lower bowel should be kept unloaded by simple enemata and rectal feeding should be employed. Purgatives should be avoided. A little morphine or codeine may be necessary to relieve great pain and to secure proper rest. Opiates, however, should be given very guardedly. Strychnine is usually indicated. When there has been considerable hemorrhage, if practicable, a quantity of normal salt solution should be left in the abdomen. (Normal salt solution should be given by hypodermoclysis or by intravenous transfusion as indicated. When there has been excessive hemorrhage, lives may often be saved by the free use of normal salt solution. In the presence of injury to the large bowel, it is best to give

simple sterile food by the mouth, that is readily absorbable from the stomach, and to introduce nothing into the bowel *per anum*, lest the wound in the large bowel be forced open.) In the after-treatment of these cases, when there is marked gaseous distention, with a tendency to intestinal paresis, alum enemata, as first suggested by the late Virgil O. Hardon, of Atlanta, are of great value. Sulphate or salicylate of eserin in doses of one one-hundredth of a grain, every three to six hours, has seemed to have a salutary effect. I absolutely exclude milk-and-egg diet by the mouth for the first five to eight days. Milk and eggs tend to increase the formation of gas and to constipate the bowels.

Purgatives should be employed with great care and only after four to six days following the operation.

It is unfair to quote military statistics as an argument against operations in civil life. The conditions under which the injuries are received and the character of the injuries are so different as hardly to admit of just comparison. In modern military practice the abdominal injuries are due to small-caliber, steel-jacketed bullets of high velocity, which go directly through, making small, clean-cut perforations in the hollow, as well as the solid, vescera, from which there is very little leakage or hemorrhage. The injuries are more frequently than otherwise received in the standing posture, with a comparative empty intestinal tract, by individuals in the prime of life—picked specimens of physical manhood. In civil practice, the individuals are more frequently than otherwise shot in drunken brawls, when the alimentary canal is filled with alcohol and with all sorts of irritating, and even infectious material. The wounds are made by infected bullets, which have been carried around in the hip pocket by "pistol toters," of large caliber and low velocity, that make large, ragged perforations in the hollow viscera and jagged wounds in the mesentery and solid viscera that leak freely and bleed furiously. Other things being equal, the surgeon who opens the abdomen the earliest after the injury, does his

work rapidly and accurately, and who closes the abdomen in the shortest time, will get the best results as to mortality.

The prognosis of penetrating gunshot wounds made by large-caliber, low-velocity bullets, without operation, is bad. As shown by the statistics of the Crimean War, the American Civil War, and civil hospitals, about 90 per cent. prove fatal. Stab wounds and wounds made by small shot, or small-caliber, steel-jacketed, high-velocity bullets are less fatal, giving a mortality of from 50 to 75. Wounds of the umbilical and hypogastric regions are pecuiarly dangerous. In these regions the small intestines rarely escape perforation. (The contents of the stomach are comparatively innocuous. The virulence of the infection contained in the alimentary canal progressively increases to the ileocecal junction; the contents of the large intestine are less infectious, and wounds of the large intestine are less fatal than are those of the small intestine.)

In looking over the statistics of the Grady Hospital, I find that there have been since July, 1899, 47 cases of penetrating wounds of the abdomen. Thirty-one of these were operated upon, with a mortality of 25.8 per cent. Thirteen were not operated upon, with a mortality of 62.5 per cent. Not a single death could have been attributed to the operation per se. In one fatal case, a perforation of the gall bladder was overlooked. In two fatal cases, injuries to the urinary bladder were overlooked. In two cases, the deaths were evidently due to kidney injuries, with leakage of urine into the peritoneal cavity, which were overlooked. In one case, intestinal perforations were overlooked. In another case, the abdomen was opened, found filled with blood, the blood washed out, and the abdomen closed, without finding the source of hemorrhage, the patient subsequently dying from internal hemorrhage.

These thirty operations have been done by eight different surgeons and three house surgeons (in turn); this large number of operators giving only a fair average of surgical

skill. In spite of the fatalities due to overlooked injuries, the statistics following operations have been very gratifying and have constantly improved. The cases not operated upon were either very bad cases or those in which the wound was in such a locality as to indicate no injury to important viscera. (For instance, well out in the lumber reigon, high up in the hypochondriac region, or in the epigastric region.) The average of the cases operated upon has been worse than those treated expectantly. (The contra-indications to operation are bad surroundings, incompetent help, and the lapse of twelve hours or more between the receipt of the injury and possible surgical aid. Other things being equal, the mortality is in direct proportion to the length of time elapsing between the receipt of the injury and surgical intervention. After eighteen to twenty-four hours, the mortality is so great that operation should be undertaken only when something positive can be accomplished by it. After this lapse of time, nature has often done her best to repair the damage, and an operation frequently increases the hazard.)

My personal experience and responsibility cover but 16 cases. I have, however, had intimate knowledge of most of the 47 Grady Hospital cases recorded below, and have assisted in or been present at many of the operations done by other surgeons and have followed up their cases in the wards. I have been forced by these observations and experience from an attitude of passive expectancy to a position of earnest advocacy of early operation in all penetrating wounds of the abdomen, unless positively contra-indicated by the individual's physical condition and surroundings, or the absence of a competent abdominal surgeon and assistants.

Of my 16 cases, 9 had the benefit of early operation, with 7 recovering. The percentage of recoveries were 77.7. Seven of the 9 operations were for rifle or pistol-shot wounds, and all presented grave visceral lesions. One had an extensive laceration of the liver, with excessive hemorrhage, the patient exsanguinated and pulseless at wrist; result, recovery. One

had three perforations in stomach with leakage; recovery. Three had multiple perforations in the small intestines with leakage in all; 2 recoveries, 2 deaths. In one of the above, the bladder was also injured; recovery.

Two operations were done for stab wounds of the liver. Free hemorrhage in both cases was controlled by suture of the liver wounds and gauze packing; both recovered. I have treated four pistol-shot wounds of the abdomen expectantly, with 3 deaths and 1 recovery. One man with a stab wound, treated expectantly, died. Five cases, 4 deaths, 1 recovery; 80 mortality. I have done two late operations for complications due to penetrating wounds that might have been prevented by early operation. Both died; mortality 100.

The above statistics, my personal experience, observation of our Grady Hospital cases, and a careful review of the literature on penetrating wounds of the abdomen have led me to make the following conclusions as to civil practice:

1. In civil practice every suspected penetrating wound of the abdomen, under favorable conditions of practice, should have the benefit of wound tracing.

2. When the wound proves to be pentrating, an exploratory laparotomy should be done at once and visceral damage excluded or repaired as far as practicable.

3. There is far less danger from "wound tracing" than there is from probing or from "masterly inactivity," while awaiting positive evidence of visceral damage requiring operative interference.

4. Local toilet with moist sponging for cleansing is better than free peritoneal irrigation.

5. When in doubt it is safer to drain.

6. Operations done within two hours should not give a mortality over 25 to 30, within four hours over 40, within six hours over 50, within eight hours over 60, and within twelve hours over 70.

7. After twelve hours expectant treatment is advisable, unless there is some definite indication for operation.

The above deductions do not apply to military practice. Expectant treatment in military practice has given better results with wounds made by modern arms than has operative treatment. (It does seem, however, that a mortality of 75 in military practice under the expectant plan of treatment is too great, and ought to be reduced in future warfare by thorough organization and equipment of the medical department, prompt ambulance service, aseptic first aid, well-appointed field hospitals in charge of competent abdominal surgeons and nurses, and a proper selection of cases for expectant treatment and for laparotomy.)

DISCUSSION.

Dr. J. Garland Sherrill, of Louisville, Kentucky.—I want to emphasize one point in Dr. McRae's paper, and that is the value of incising along the line of the track of the bullet, and not attempting to explore either by finger or probe.

I can recall one case occurring in my early work when an interne at the Louisville City Hospital, where a median section was made, the abdomen explored, and the patient's life lost, because, in the exploration, the original wound was not followed. The colon was injured external to the peritoneal cavity, and as a result sepsis developed, involving the peritoneum, and the patient lost his life when it might have been saved by exploration of the original wound.

Dr. Le Grand Guerry, of Columbia, S. C.—Dr. McRae takes the position that in a given case of penetrating wound of the abdomen, after twelve hours have elapsed, from the receipt of the injury, it is a contraindication to operation. I wish to take exception to that statement in the Doctor's paper. We have always felt in a given patient, it matters not how slim his chance, if he had one chance in a thousand, we should give it to him should he so desire.

Last year before this Association, at its meeting in New Orleans, I reported a series of eight consecutive cases of gun-shot wound of the abdomen, with one death. Since that meeting I have had two additional cases, which I desire

to add to the same series without any additional death —ten cases in all, with one death.

With reference to the twelve-hour limit, I will say one of my cases was a boy, about ten years of age, who had twenty perforations of the intestine; operation was done twenty-six hours after the injury, followed by recovery. Another one was a colored man, who was shot at two o'clock Christmas Eve; was operated on Christmas night, between eleven and twelve o'clock, thirty-six hours after, and recovered. Another, a boy, was operated on eighteen hours after the injury, with recovery. In the same series reported last year I operated on some of them more than twelve hours after the receipt of the injury, with recovery.

I feel that Dr. McRae's paper, while it is judicious, needs qualification in that particular, because the sum total of mortality from all cases operated on, and the sum total of cases treated expectantly, will show that the balance is greatly in favor of the cases that are operated on. I do not feel that we should consider for a minute operating on a man, whether he dies or gets well, when he presents himself with a gun-shot wound of the abdomen, if he is not in *articulo mortis*, judging from my experience in these cases, and presumably many of them would die, if not all, if not operated on.

Dr. Randolph Winslow, of Baltimore.—One of the most important things for the general profession to realize is the impropriety of the physician, who may happen to be called first to a case of gun-shot or stab wound, attempting to explore it himself. Nothing should be done to an injury of that kind until the patient has been removed to a hospital or to whatever place he is going to remain in, where the operation may be performed in a proper manner.

I want to call attention to the fact that there are many injuries that apparently are not injuries of the abdominal cavity, which nevertheless are penetrating wounds of the abdomen. Wounds of the thorax below the fifth rib are very frequently penetrating wounds of the abdomen, and require that the abdomen shall be explored. Such wounds are liable to injure the liver and go through the diaphragm and injure the stomach, and go still farther in some cases and injure the intestines.

In regard to the proper point for the incision for exploring

the abdomen for gunshot wounds, where the intestines have been injured almost to a certainty, unless we know the bullet has traversed only a small portion of the abdominal cavity toward the flank, the proper place for the incision is the mid-line, where one can get at the different viscera much more readily than by incising at the point of injury. In some cases of penetrating wounds of the abdomen, in which we may be in doubt as to whether the bullet has entered the peritoneal cavity or not, it seems to me best to explore by an incision not through the line of the track of the bullet, or the stab, but make a fresh incision through the abdominal wall at another point, so that we can evert the abdominal wall, and see whether or not the bullet has entered the peritoneal cavity, and which will also permit of more ready treatment of the injuries that have been inflicted. Stab wounds are less serious in a certain way than those due to gun-shot. Hemorrhage is apt to be greater in stab wounds than in gun-shot wounds; but the injuries are usually more extensive in the case of gun-shot wounds. In a gun-shot wound the bullet may traverse the abdominal cavity from one side to the other, whereas a stab wound only traverses the abdominal cavity to a limited extent. The increased danger, therefore, from stab wounds is on account of hemorrhage, which is in excess of that of a gun-shot wound, while a stab wound does not produce the same number of perforations or injuries, or if it does produce injuries, they are likely to be localized. In a case of gun-shot wound, the ball in traversing the abdomen is liable to produce a number of perforations which are difficult to find, especially if one is operating at night and under circumstances which may not be favorable. The high velocity, nickel-jacketed bullets of the army rifles may pass through the abdominal cavity in some manner without causing death; but it is certain that in Baltimore, if a white man or a negro man or woman is shot through the belly, with the ordinary low velocity pistol bullet, that person is going to die in nearly 100 per cent. of cases unless an operation is performed; and the proper procedure in civil practice at least, is laparotomy, with repair of the injuries that may have occurred, and I am not at all sure it should not be done in military practice.

Dr. C. E. Caldwell, of Cincinnati, Ohio.—I think three years ago I reported nine cases of penetrating wounds—

stab and gun-shot—of the abdomen. Since that time, I have had three other cases. At New Orleans last year, I think it was, I rather insisted upon following out the line of penetration by exploring the wound before the abdomen, and pointed out that the fallacy of the other means lay in the possibility, particularly in stab wounds, of overlooking the direction of the wound. I narrated on that occasion a case in which the bullet entered the region of the liver and penetrated through the thick fascia. I explored it, and was under the impression, from the fact that I could not find any track of the bullet at first, the ball had not penetrated, and although there was no evidence from the track of the bullet in that regard, nevertheless I incised the fascia in this region under the rib, discovered the track of the bullet, opened up to the peritoneum, and found the bullet lying on the peritoneum. It was picked off the peritoneum, the wound closed, and the patient recovered. There an exploratory operation through the median line would have been useless.

In another case, where the patient was stabbed on the left side, where it was difficult to determine whether the wound had gone into the thoracic cavity or abdomen, I followed out the course in this instance of opening in the median line, and finding no wound of the intestines explored up into the vault of the diaphragm, and could not discover any evidence of a wound of the diaphragm. But this patient was returned to bed, and died the next day. At the autopsy almost the whole stomach was found in the pleural cavity from a wound in the diaphragm which I could not discover on exploration. How this happened, I do not know. I could not discover it by passing the hand over the vault of the diaphragm yet almost the entire stomach was found in the pleural cavity at the autopsy, as I have stated. I should have resected and found out the course of the bullet, and by resection of the rib or ribs I could have sutured the diaphragm and prevented the fatal consequence. So, after that experience, I believe it is wise in these cases to follow the track of the bullet; if necessary, open in the median line afterward, but that is another matter.

Dr. George A. Hendon, of Louisville, Kentucky.—There are three factors that cause death of patients in this class of injuries—hemorrhage, sepsis, and the most frequent one is

the overlooked perforation. I think it is very important for us to consider in the management of this class of injuries some method by which we may be able to discover every one of the perforations that exist, and toward this end I have found it appropriate to use some harmless colored fluid, allowing it to flow into the intestine over the known course of the bullet, and then watch for its issue upon the outside lumen of the gut.

Dr. Charles M. Rosser, of Dallas, Texas.—As illustrating the difficulty in reaching conclusions which would seem apparent, a little while ago, in my service at the City Hospital, I received a message to the effect that a fleeing negro had been apprehended by a policeman's bullet. The negro did not seem to be especially injured, as he was hit upon the most thoroughly protected part of his anatomy, the hip. Notwithstanding this, he kept going, but was finally overtaken, placed in jail, and from there was taken to the City Hospital. The symptoms were so obscure in manifestation that is was not thought necessary to follow the wound or to explore for possibilities. An intelligent interne said that "there was no shock at all; that evidently the bullet has lodged against the ilium, and there will be no trouble." About midnight I received a message to come and see the patient at once, and notwithstanding the most rapid means of transit when I reached the point the negro was dead. The indications all came within an hour or less time. An autopsy was refused because of the ignorance of the family, and I am not able to tell the condition that existed except that there was absolute penetration at that point which caused death. The man lived for six or eight hours without any symptoms of shock. Under the same conditions I should propose not to lay too much stress on clinical symptoms. My own experience has been that in penetrating wounds of the abdomen in the majority of instances we are enabled to discover the injuries by incision at the point where the best work can be done in case we suspect the existence of an injury. Following the course of the bullet, as we all know, is difficult. In conditions where early symptoms of perforation or hemorrhage exist, it seems to me it would be proper to make an incision where it would be most convenient to get access to the probably injured parts.

Dr. John Young Brown, of St. Louis.—It is generally agreed among surgeons in civil practice that the only abso-

lutely accurate method of arriving at a diagnosis of penetrating wounds of the abdomen is by an exploratory operation. Many of these cases give no symptoms. I have seen cases in which there were ten to sixteen perforations of the bowel, with no symptoms of shock whatever for the reason that the mesentery was uninjured. My experience has been that in those cases in which symptoms are manifest early, they are due to hemorrhage.

I quite agree with Dr. Hendon in emphasizing the fact that an overlooked perforation is frequently responsible for death. We have made it a uniform rule at the City Hospital, St. Louis, to practice a certain routine in searching for perforations. An incision is invariably made in the median line, the stomach examined, fore and aft; then the transverse colon. The small bowel is picked up at the angle of Trietz and traced down, the patient being gradually elevated to assist the return of the bowel. The perforations are repaired as met with. The patient is then placed in the Trendelenburg position, and the pelvic viscera are examined.

The results in these cases depend entirely upon the care with which this work is done, as well as its rapidity, and the fact that no perforations are overlooked. Injuries to the diaphragm are quite common. I reported before the Illinois State Medical Society this year sixteen cases of injury to the diaphragm. It is simply amazing how few symptoms patients so injured present. I recall two cases coming under our observation at the City Hospital where the chest was laid wide open with a large wound in the diaphragm and stomach. If a cloth had been spread over the incision or opening in the chest, it would have been difficult to have told from the symptoms the patient was injured at all. The pneumothorax present gave very little disturbance, and in two of the cases we were able to see distinctly the lung partially functionating.

I do not believe it is possible to make a diagnosis in these cases without early operation, and I think if we demonstrate that a bullet has penetrated the abdominal or peritoneal cavity, we should enlarge the wound of entrance, demonstrate penetration and assume that perforation is present, and at once subject the patient to operation. In the hepatic flexure of the colon and in the splenic flexure it is quite difficult to locate perforations. We have found that ballooning

of the colon will frequently diagnosticate a perforation in this locality which otherwise would be overlooked. In all these cases if a systematic technique is carried out, tracing the small bowel to the ileocecal valve, from the angle of Trietz, gently, with the assistant returning it, we subject these patients to comparatively little harm and overlook no perforations.

Another point I would emphasize is the treatment of shock in these cases. It has been our custom, where the mesentery has been badly injured, and severe hemorrhage has occurred intra-abdominally, to use hot saline solution early in the course of operation, and it is wonderful how these cases will respond to the saline solution.

Dr. Andrews, of Chicago, has devised an ingenious apparatus for introducing saline solution into the abdominal cavity during operation, to combat shock.

As to irrigation, we do not use salt solution for the purpose of irrigation, but simply to combat shock, making a routine search for perforations, doing a quick and early operation, overlooking nothing, and paying particular attention to injuries to the diaphragm, which are very much more frequent than one imagines. In 536 cases of stab wounds, we had 16 cases of injury to the diaphram. These cases have been reported.

I think this subject is a very important one, and that many patients die from gun-shot and stab wounds all over the country through the mistaken idea that we must expect symptoms before we operate for the closure of such perforations.

Dr. McRae (closing).—There is one misapprehension on the part of Dr. Guerry, and that was with reference to simple exploratory operations. I stated that after twelve to eighteen hours the mortality would be about 70 per cent. Dr. Guerry has been peculiarly fortunate in obtaining such results as he has mentioned. I pointed out, too, that after the time mentioned we operated for positive indications. I wanted to bring that out in contradistinction to having positive symptoms in the early cases. Every man who has seen gun-shot wounds of the abdomen knows that the most serious of them often present the fewest symptoms, and I do not think any man can form anything like a conclusion

of the least value as to whether there is a serious intra-abdominal injury or not from the outside.

As to Dr. Winslow's position in these cases, that we ought to open the abdomen in the median line, I think that will often be a mistake. Frequently, after tracing the wound and finding the bullet has penetrated, it is better where we cannot exclude penetration, to open the abdomen. Dr. Caldwell makes quite clear the advantages of this method and the reasons for exploring at the point of injury rather than through a median incision.

As to the method of operating, we have all got some systematic way of dealing with these cases, and it must be done systematically if it is well done. I do not think, however, I would adopt the method which Dr. Brown has described, for the reason that I think I can get at the injuries better in another way, namely, catch the first piece of an intestine that comes up, slip a strand of gauze around it, hold it with forceps, nick one side or the other, following the extreme end of the bowel in that way, and lifting it up by forceps, tracing the intestine in a systematic manner. The assistant can pour salt solution as you proceed, and the intestine replaced, so that only a small portion of the intestine is out at a time. In cases of hemorrhage and deep-seated injuries, I make a long incision, and eviscerate in these exceptional cases.

SOME RARE FORMS OF HEMATOMA.

By J. Garland Sherrill, M.D.,
Louisville, Kentucky.

Our attention has been attracted recently by three cases of hematoma which continued for a much longer period than is usual in such condition, presented some difficulty in diagnosis and gave no clear explanation for their persistence except perhaps in one, where the patient was a bleeder.

In the literature on the subject we find an abundant amount of material upon hematomata in the pelvis and about the genitalia, but a great paucity of reports of cases in other portions of the body similar to the ones we report. We can account for this apparent lack of interest either because of the frequency of occurrence of hematoma, such cases have been passed over with little attention, or from the real infrequency of occurrence of cases of long standing. Or, again, the difficulty of correctly explaining their pathology may have deterred any one from taking up their investigation.

It seems to us that such cases afford some food for study in the hope of determining, if possible, the reason for their slow but steady development and their failure to follow the usual course of blood effusions. In order to determine these points we must call attention to the changes which usually follow a traumatism with the extravasation of blood in such an amount as to produce a hematoma. Hemorrhage will usually cease in a short time if the vessel be not of too great size, partly from the result of pressure against the surrounding tissues, partly from retraction and contraction of the vessel walls, and finally from the inherent power of coagulation of the blood. The

fluid portion of this clot is normally asborbed in the course of a short time, then the corpuscular elements undergo degenerative change, a portion being obsorbed and the residue remaining as pigment or hematoidin. In the presence of infection resorption of the clot does not occur, but disintegrates and forms pus. In certain portions of the body, as in the serous cavities, neither of these courses obtain, but the blood remains fluid indefinitely. The exact cause of this fluidity has not been positively established, but it is supposed that the endothelium of these sacs contain or secrete a substance capable of preventing coagulation, and that these cells perhaps have a property similar to that ascribed by some to the endothelium lining the bloodvessels.

Subsequent to the absorption of the clot other changes may occur in its locality resulting in the formation of a fibroid or other form of neoplasm. A. Hoffman, in 1895, remarks that fibroma as well as other neoplasms of the abdominal wall are usually traced to some form of injury in which bloody effusion has taken place, and describes among tumors of this class a case of hematoma which had existed for seven years, as follows:

"Mrs. S., aged sixty-three years, came under treatment for gastric catarrh. On percussion of the epigastric region an unusual dull resistance was detected beginning from the lower border of the liver and extending downward. Close inspection of the abdomen showed a flat arching to the right of the umbilicus extending upward and gradually fading laterally. The tumor was distinctly limited to the linea alba. Bimanual examination showed its dimensions to be 7 to 8 cm. by 10 cm. As the abdomen was very flabby through previous five pregnancies it was easy to grasp the tumor within the palpating fingers.

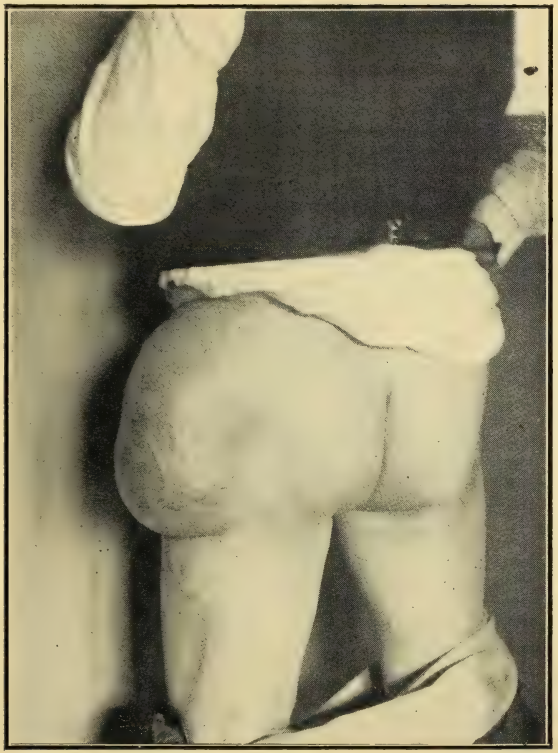
"The history was that she felt a sudden, stabbing pain on the right, about seven years ago, while threshing, as if something had burst within the abdomen, and upon feeling the part she noticed a swelling about the size of a pigeon's egg.

"The entire character of the growth points to a fibroma having its origin in the right sheath of the rectus muscle, superinduced by the original hematoma."

W. W. Van Arsdale reports an ossifying hematoma (*Annals of Surgery*, 1893, vol. xviii) which developed within six and one-half weeks after injury to the muscles of the arm. Dissection to the bone between the biceps and the brachialis anticus exposed a mass of apparently solid bone, continuous with the humerus, about 9 cm. in length, and 3 cm. broad and high. This bony mass had taken the place of the intramuscular ligament or septum, and had invaded the origin of the brachialis anticus, so that the fibers of the muscle adhered directly to the new growth, and it was consequently difficult to say where the muscle ended and the bone began. The periosteum could not be lifted off from the tumor with the muscles attached, but appeared continuous with it; nor was it possible to say where the periosteum ended and the bone commenced. The chisel entered with some difficulty through the ossified external coat of the tumor, which was nearly 1.5 cm. in thickness, into a cavity; and this appeared filled with partly coagulated blood of a dark brown color; at the bottom of this cavity the bone was porous and bled on being scraped." He says, "It is true, and I am fully aware of the fact, that the handbooks of surgical pathology do not teach that a hemorrhage of the kind here reviewed can ossify," although Heinecke says: "Large encapsulated extravasations beneath the periosteum of a bone *still growing*, may become enveloped with a bony capsule, as in the newly born."

Hennig (*Monatsch. f. prakt.*, Thierheilk, Berlin, 1899, 00, xi, 481), in an article upon "Hematoma in the Horse," quotes freely from a number of authors in explanation of the pathology of this condition:

"According to Billroth and v. Winiwarter, hematoma is caused by kicks or blows. The rupture which follows this crushing extends not only to the bloodvessels, but also to the lymphatics. There will be then a collection of blood and



Case I.—Hematoma, rear view.

Case I.—Hematoma, side view.

lymph in the tissues. The more vascular the parts involved and the greater the force of injury, the greater will be the extravasation, especially where a larger artery or vein is involved.

"Gussenbauer agrees with the above and thinks that these extravasations are really a mixture of blood and lymph, as there is separation of continuity in both blood and lymph vessels, necessarily followed by outpour of the contents of each.

"La Motte and Pelletan hold that these extravasations are a form of serum and compare the process to that of allowing blood to form a coagulum when placed in a vessel.

"Velpeau is of the opinion that the subcutaneous tissue is injured in such a manner that a collection of serum takes place between the aponeurosis and the general wall and compares it to a serous cyst.

"Morel-Lavallee treating on this subject, says that the tearing of small vessels and capillaries permit only the passage of the fluid components of the blood from the crushed ends. The oozing thus taking place, like in any other wound, consists mainly of a collection of the red blood serum.

"Hertwig states that the tissues involved when a trauma is inflicted offer a certain amount of resistance by tension, which causes a weakening and as a consequence blood or blood serum trickles through the vessel-walls or the lymphatics into the surrounding tissues.

"Semmer says hematoma occurs after injury of the blood-vessels in parenchymatous organs or in the solid membranes. The blood is at first liquid, but later on coagulates. After breaking down and resorption of the blood which has been poured out, the hematoma disappears entirely, or it leaves a cyst filled with serous fluid, or a pigmented cicatrix.

"Hoffman describes two cases which he considers to be lymph extravasations. In the first case he made an exploratory puncture on the second day. A bright red, watery fluid escaped and upon enlarging the opening with a lancet, from

1.5 to 2 liters of the same fluid followed. This became purulent in a few days. The second case was one of tumor at the outer surface of the right thigh, with its largest dimensions over the glutei muscles. The same results followed its incision.

"Frohner denies the occurrence of lymph extravasates and says that fluctuating tumors resulting from traumatism are true hematomata. He points to the fact that the crepitation which is noticed at times upon palpation is due to the coagulated blood within the tumor."

The following hypotheses may be offered as possibilities in explanation of this condition:

1. That the blood might flow through a sac returning into the vessel, and remain fluid at least in part, just as is the case in aneurysm.

This proposition would seem to be fallacious because these hemorrhages are probably venous, and the tendency of a vein is to collapse immediately upon injury, and, moreover, no such patent vein has been noted in any of these cases.

2. That the cellular tissues possess the power of secreting a substance which tends to prevent coagulation.

This seems clearly refuted because the infrequency of the occurrence of persistent hematoma would appear to prove the lack of such power of secretion.

3. That slight infection, present in insufficient amount to produce suppuration, results in such change that the blood cannot be taken up by the absorbent vessels.

This theory seems to us to be irreconcilable to the facts in the case, for effused blood has but little power of resistance, and any culture of bacteria should find there an excellent pabulum, and suppuration would be inevitable.

4. That the tissues about a hematoma might be so dense or so compressed that the absorbent vessels would be occluded or obliterated, thus preventing the accomplishment of their normal functions.

This proposition seems to us to have a more probable

foundation in fact, although not accounting fully for the phenomena.

5. That coagulation does take place, but when disintegration occurs the blood remains fluid but not absorbable.

This contention seems also within the range of probability.

6. That the constant escape of fresh blood occurs in a quantity sufficient to more than make up for the loss in volume from absorption.

In proof of this we believe that it can be demonstrated that the escape of fluid into a hematoma does occur as is shown in my cases, in which the tumor increased in size steadily. In one the bleeding occurred from a wounded vessel in the femur; in another the source of the blood could not be discovered, but we thought it came from a small vein.

There is also the possibility of blood being manufactured inside the sac, as in the case of the development of the circulatory apparatus in the embryo, although to us it seems highly improbable that this could occur in adult life.

We conclude, therefore, from the evidence at hand that the tissues about an hematoma, from pressure lose their power of absorption; that even though coagulation and disintegration do occur resorption does not result, and that in some instances at least there is a continual addition to the amount of blood in the sac by an outflux from the damaged vessel.

In this connection we will report three cases, which, while not identical in their clinical course, present some symptoms in common:

Case I.—Frank R., white, aged thirty-eight years; saloonkeeper and ex-baseball player. Was referred to us in 1902, at which time he presented a large growth over the right hip which was increasing steadily in size. The trouble began ten years previously, and appeared as a small nodule which his attendant thought to be a fatty growth, but which the patient attributed to a bruise while hunting. He claimed that this injury was received in sliding over the rail fences. He refused operation at this time.

He was seen again in January, 1904. The growth at this visit was considerably larger than when I saw him before, and was 28 inches in circumference; 10 inches in length, and 7 inches in width. It was painless and quite firm, but elastic and not very hard. It creaked slightly when moved under the hand, and seemed to spring from the deep fascia covering the muscles in the gluteal region. It lay over the hip-joint, but was not attached to the trochanter. Large venous trunks were seen ramifying over its surface, and all the veins of that limb were markedly varicosed. It did not move freely, although there was no infiltration beyond its capsule and no glandular involvement. From the firmness of the tumor there was but little suspicion of its condition being a cyst. The diagnosis of a probable benign growth of fibrous tissue type was made. Sarcoma was excluded by the length of time which the condition had existed, although its appearance and vascularity made it very closely resemble one. The patient's health was not at all impaired.

In January, 1905, the growth was considerably larger, but not less movable than before. It was then 32 inches in circumference, 14 inches long, and also 14 inches across from base to base and 8 inches across superficially.

It was removed on January 18, 1905, and was found to be composed of a rather thick fibrous tissue wall, the inner surface of which was quite smooth, the cavity containing a large quantity of fluid blood somewhat changed in color. There was no marked evidence of clotting, although there was some brownish deposit along its wall. The microscopic examination showed the condition to be one of simple hematoma, and Dr. John E. Hays, who made the examination, reports as follows:

Macroscopic Findings. "This tumor contained numerous cysts or cavities filled with blood and fibrin. Across the cavities—the larger ones—extended firm bands with smooth, glistening surfaces. All the cavities examined seemed to

communicate. The wall of the tumor was very irregular in thickness.

Microscopic Findings. "The wall of the tumor consisted of rather dense white fibrous connective tissue, well formed and showing no signs of cellular activity. The bundles of fibers were separated by an infiltration of blood cells, sometimes only a single row of cells separating the fibers; then again there would be a larger number, giving the appearance of small cysts. The inner surface of the walls was covered by layers of fibrin, but nowhere could an epithelial or endothelial lining be made out.

The bands or trabeculæ had the same structure as the wall.

Case II.—Mrs. H. W., white, aged fifty years; April 2, 1907. History of having given birth to nine children; always remained well until January, 1907, when she noticed a mass in the abdomen. Some time previously in carrying a tub of ice she had fallen with the tub on top of her. Had suffered some from the bruising, but was not seriously inconvenienced by it. The mass in the abdomen had increased in size rapidly since she first noticed it, and at this time was larger than a man's head. She was a very fleshy woman, and her weight had remained stationary. She had suffered some pain in the region of this growth but had no serious discomfort, although she was somewhat worried as to the outcome of the conditon.

Examination revealed the abdomen to be quite prominent near the umbilicus and on the left side. A palpable mass presented in or adherent to the abdominal wall, extending well to the left of the median line, and also slightly to its right. It was separable from deep structures, but not from the skin, and was dull on percussion, surrounded by tympany at the edges. It was not fluctuant and there was no palpable mass in the pelvis.

A positive diagnosis was not made. Hematoma, sarcoma, and cyst of the urachus were considered to be among the probabilities. Urinalysis: Specific gravity, 1008; no albumen; no casts; no sugar. Blood examination showed num-

ber of leukocytes to be 7500; red corpuscles, 5,000,000; hemaglobin, 70 per cent.

She was a dangerous anesthetic risk owing to an irregular and intermittent heart, but the operation was safely performed under gas-ether anesthesia, although she gave the anesthetist considerable annoyance and alarm. The condition proved to be a hematoma of the rectus sheath containing partly fluid and partly clotted blood. The cavity was packed with gauze for a few days, and the convalescence was uninterrupted.

Case III.—Robert K., white, aged fifteen years. This boy was seen on August 7, 1908, with Dr. T. E. Chapman. He presented a history of an injury to the left thigh some two or three weeks previously. I found a slight swelling on the outer and anterior aspect of the thigh, which we considered to be a hematoma resulting from the injury to the limb. Advised the usual measures for its treatment.

He came to us again on October 5, 1908, having been seen by a number of other physicians, some of whom had made the diagnosis of sarcoma. They had arrived at this conclusion after aspirating the tumor and obtaining only a little blood, and an *x*-ray examination having failed to show any evidence of disease of the bone. A very small incision had also been made into the tumor down to the bone, which was reported to me as having disclosed only that the bone was slightly damaged.

The tumor upon his thigh had increased somewhat in size since I last saw him. I found on examination the mass to be at this time about the size of an orange, apparently not intimately connected with the bone, but to be attached to the deep muscles and apparently moving with the soft parts over the bone. No fluctuation could be clearly made out, although it seemed to be cystic. The incision which had been made was not yet quite healed. The suspicion of sarcoma was so strong that I prepared to have a frozen section examined if it proved to be a tumor, although I still believed that it was a

hematoma, basing my opinion largely upon my former examination and the history obtained at that time.

Operation, October 7, 1908, revealed the condition to be a hematoma. After the clots were removed we found a bare spot on the bone about the size of a nickel, from which the blood was oozing. Careful examination revealed several spicula of bone, as the result, evidently, of contusion at the time of the injury, which caused an incomplete fracture. The bone bled more freely than is usual; otherwise the condition was satisfactory. The persistent hemorrhage was controlled by gauze packing and the wound closed.

On October 10, 1908, the gauze pack was removed and apparently no hemorrhage was excited at the time, but during the night following a persistent oozing occurred and the sac was again filled with blood. This was again removed under chloroform on the day following, and the wound again packed very carefully. On close questioning this boy was found to be a bleeder, having had a number of attacks of severe hemorrhage from very slight traumatisms, and this undoubtedly in part accounted for the persistence of the blood tumor. Subsequently he made rapid progress to recovery.

We have also seen several cases of blood cysts in the neighborhood of the knee-joint, which we considered as hemorrhages into bursal sacs near the joint, but which we did not consider as belonging in the class of cases here recorded, although in the literature we have found mention of such cases.

The following cases have been collected from the literature, which, as we have stated before, is not very voluminous on this subject:

Nagel L., *Zeitschr. f. Wundarzt, u. Goburtsh*, 1866-67, xix, 180.

Case I.—Boy, aged six years, had a small blood cyst, size of a small hen's egg, in the right inguinal region, for which there was no assignable cause, which became inflamed and painful. As it showed some fluctuation it was lanced. No

pus followed, only blood, resulting in collapse of the cyst. Length of existence not stated.

Case II.—Man, aged fifty years, had a tumor on the anterior aspect of the knee, fluctuating, but not inflamed or painful, and was brought on by kneeling, his occupation being that of a mason. On opening the same the quantity of blood was so great he became faint and compresses had to be applied to check the remaining collection. No further history given execpt that he was dismissed from the hospital on the ninth day.

Auvard, *Bull. Soc. Clin.*, Paris, 1861, v, 98.

Case of a man, aged fifty-two years, with hematoma of right arm, size of two fists, situated at the antero-exterior surface. He first noticed a small swelling, 5 to 6 cm., about a year ago, appearing without appreciable cause. No pain or inflammation, but a weakening of the entire arm for which he came under treatment. General health good. The tumor shows fluctuation in all parts. He gave a history of spitting blood when nine years old; typhoid fever without hemorrhages at twenty-five, and passage of blood per anum at thirty, but denies hemorrhoids. The author call this a case of "spontaneous" hematoma, as there is no traumatism connected with the history. He removed the cyst. Recovery.

Combeleran, *Toulouse Medical*, 1905, vii, 78.

Reports two cases of hematoma with fever. The first man, about forty years, fell down and struck the outer surface of the right thigh. Was able to walk for four days after the accident when he was seized with violent pain in the part accompanied by swelling of both thigh and knee. The pain increasing he entered hospital two days later. No signs of fracture could be detected, but some effusion into the knee-joint. For three days the temperature oscillated between 37° and 38.8°. On the fourth day it rose to 39.2°. At this time an incision was made over the external aspect of the thigh and a large quantity of blood was evacuated. Temperature, 40°; suppuration of the hematoma; several days of drainage and repeated incision eventually led to a cure.

The second case was in a tabetic subject, who in making a false step fractured the left femur at the middle part. The day following his temperature was 38°, and a voluminous hematoma was detected in the thigh. The temperature did not fall for six days. No further details are given.

This writer says these two cases are interesting, as experimental and clinical facts show that elevation of temperature is not always due to infection, but to the resorption of certain organic substances. Experiments on animals demonstrate that blood, injected into an animal of the same or different species, causes a rise of temperature, whether done subcutaneously, intravenously or into a serous cavity. Clinically, the above cases showed fever following immediately the effusion of blood. Opinions are divided as to the causes of this rise of temperature. Some hold that the white corpuscles are increased or altered. The same difference of opinion exists as to the causes of resorption. Is it the leucin, the fibrin ferment or the nuclein?

Lemariguier, A., *Thèse*, Paris, 1886.

Case I.—Clerk, aged fifty-four years, fell down the stairs, striking his left thigh, but continued his occupation as he was able to move about without great inconvenince. Ten days later he noticed a swelling the size of a fist, painless, except upon strong flexion of the knee, which rapidly increased and infiltrated the subaponeurotic parts of the lower portion of the thigh. Considerable pain and inflammation now set in, with spontaneous rupture of the sac several days later. Recovery.

Case II.—Leather dresser, aged forty-three years, hematoma of left clavicular region. Seven months before, in carrying a heavy load on his shoulder, he suddenly felt a crackling at this site, and next day noticed a swelling about the size of a nut, without ecchymosis or pain. Within the last two months it had attained the size of a hen's egg.

Diagnosis. Lipoma, cold abscess or hematoma. On incision about 100 grams of a syrupy, chocolate-colored fluid was evacuated and the walls of the cyst extirpated. Further

examination revealed its true nature. Suppuration followed the operation, but recovery gradually took place.

Case III.—Man, aged thirty-three years, reported by M. Follet to the Surgical Society, February 25, 1885, that twenty years before in trying to raise himself from the floor experienced a sharp pain in left buttock. Several weeks later he noticed a swelling, size of hen's egg, which gradually increased in size, until it reached that of a man's head. A small ulcer had formed and this evacuated a sanguinolent fluid, estimated at between 7 and 10 liters. Diagnosis of encysted hematoma from rupture of the gluteus maximus. Operation was done with great difficulty and recovery tedious.

He says in conclusion:

1. Traumatic bloody effusions terminate ordinarily by complete resorption.

2. Resorption is more or less slow and is sometimes favored by the infiltration of the blood in the neighboring connective tissue, or the accidental rupture of the cyst.

3. Leukocytes play a considerable role in the absorption of the blood.

4. Hematoma sometimes terminates by abscess, sometimes by plegmon, diffused or circumscribed.

5. The causes of non-resorption of the blood are numerous, especially the seat of the hematoma, such as the buttock, the superior and external side of the thigh, etc., and in the parts having abundant adipose tissue. The amount of blood encysted is no obstacle to resorption.

Reverdin, *Bull. Soc. Anat.*, Paris, 1868, xliii, 612.

Hematoma of right rectus muscle of the abdomen in a woman, aged thirty-nine years. Was admitted to hospital September 15, 1868, with pulmonary phthisis. On September 29, she felt a sudden pain in the epigastric region, which she compared to a blow, and which was greatly increased on pressure. The skin presented nothing particular. In the course of a few days it disappeared. On November 26, during a fit of coughing she was again seized, this time with greater

intensity than before. Tincture of iodine was applied with but little relief; in fact, she did not respond to any of the remedial measures instituted, and death came to her December 5. Autopsy showed the muscles of the right side of the abdomen infiltrated with blood, with inflammation of the muscle tissue as demonstrated by microscopic examination. He called it a "muscular hematoma."

McLeod, *The Indian Med. Gaz.*, Calcutta, 1880, xv, 305.

Hematoma, or venous aneurysm, removed from the left axilla of a male, aged forty-five years. About two months before admission noticed a small swelling, size of a betel nut, in his left axilla; it was soft, painless, and freely movable. It began to increase and in fifteen days was as large as a hen's egg. In one and one-half months it filled the axillary space, size of a cocoanut, got tense, painful and exerted pressure upon the brachial plexus. It bulges downward and along the left infraclavicular and mammary region of the chest. Posteriorly it extends as far as the axillary border of the left scapula. It is bounded above by the clavicle and below by the seventh rib. Its longitudinal diameters, 8 inches, and the transverse is about a foot. The whole tumor is uniformly rounded, with a broad base; it is fixed to the chest wall. The surface of the tumor is smooth, the covering healthy and freely movable; its consistency soft and fluctuating. There is no throbbing pain, no surface edema, no increase of temperature, and no pulsation; no bruit on auscultation. There is slight deficiency of sensation in the upper and outer half of the left arm; no edema of same and no change in the axillary or brachial pulse. The tumor was explored by a fine trocar and cannula through which a free flow of dark venous blood took place and the swelling diagnosed to be a tumor containing blood.

Operation difficult and patient suffered much from shock. Recovery.

"These blood cysts are exceedingly rare and little is mentioned in the literature. It was quite certain it had not formed

in a pre-existing tumor either of a sarcomatous or angiomatous nature and it was very likely that the cyst had originally been of a serous nature, and had contracted a communication with the axillary vein. The history did not throw much light on its origin, which was and remains a mystery."

Maunsell, R. C. B., *Trans. Royal Acad. Med.*, Ireland, 1899, xvii, 514, on "Vascular Tumors of the Abdominal Wall."

Case I.—Miss F. K., aged twenty-two years, had noticed a lump in her left side just below the costal margin, but latterly it increased in size and caused considerable pain. Examination showed an elongated tumor as large as an adult hand. Pressure caused great pain. The consistence of the mass varied, some parts feeling tense and some soft and lobulated; the edge was not well defined; the skin was movable except in the centre where it appeared to be adherent. Diagnosis of lipoma.

The parts were removed and consisted of adipose tissue connecting together several cysts of various sizes lined by endothelium and containing smooth muscle in their walls, considered as of lymphatic origin. She developed erysipelas by scratching the scar, but recovered in a few weeks.

This last case can scarcely be classed under the head of persistent hematomata such as we have here reported; nor can the second case of Nagel, which was apparently an effusion into the prepatellar bursa.

The cases of Combeleran, too, while interesting, should be excluded from the list. There remain then thirteen cases in literature, including three of my own, having some similarity, yet differing in minor details. The case of M. Follet, mentioned by Lemariguier, had a duration of twenty years, while one of my cases lasted over ten years.

Traumatism was noted in all but four cases, in which the bleeding was spontaneous.

We must conclude that these cases are quite rare, since the reports are so few; also that we have no exact knowledge concerning the causes leading to their persistence. We offer

the conclusions mentioned before in explanation of their formation.

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DISCUSSION.

Dr. W. P. Carr, of Washington, D. C.—I have noticed that there are two situations in which hematoma has a tendency to persist; namely, in the scalp and in the leg. I have opened a good many hematomas caused by injuries during birth to the scalp, and the tendency for them is to re-fill, and a number I have had to open several times. It shows that bleeding persists, and some of these cases will go on and grow in extent after the blood has been once removed. I have seen three or four cases of hematoma in the muscles of the leg below the knee which remained for several months, and on opening them the blood was perfectly fluid and black as ink, without any tendency to coagulate.

OBSERVATIONS ON THE SURGICAL TREATMENT OF EXOPHTHALMIC GOITRE.

By John R Wathen, M.D.,
Louisville, Kentucky

It is with some hesitation that one presents a paper upon the surgical aspect of Graves' disease before this society, several of whose members have played a most active part in the development of our knowledge of the surgery of the thyroid gland.

Nevertheless, there are some facts which we have had occasion to observe in our own work and in the work of others to which I would like to draw to your attention.

In the past few years many new ideas have been evolved, and the collected data from clinical observations can now be studied to an advantage.

The immense amount of attention given to the parathyroids, has caused most surgeons to fear their injury in almost any operation in the neck. While we are all forced to acknowledge that tetany has been produced by the removal of the parathyroids in the dog, and has even followed operations upon the thyroid gland in the human, it is also a strange fact that many who have done a very large number of thyroidectomies have never had a case of tetany to develop.

Is it that the technique of some has been at fault, and that the injury to, or the cutting off of the blood supply to the parathyroids has been the cause? Or is it, as has been suggested, possibly due to other conditions quite independent of these structures in the neck?

Attention has been called by Mayo to the necessity of preserving the capsule of the gland, and yet, when this has been most carefully carried out, one or more parathyroid glands are occasionally found embedded in the structures of the tumor removed, and yet no harm has resulted.

It is not the purpose of this paper to decry laboratory experiments upon lower animals in the search for new physiological data, but we should be especially careful in accepting the conclusions of some who are giving us new facts occurring in the physiology of animals, and not necessarily applicable to the human body.

Likewise, the isolated and unfortunate experience of one or more clinicians should fail to be accepted as proved conclusions.

While we realize that a good percentage of cases of Graves' disease will recover with or without any treatment whatsoever, we still are forced to acknowledge that surgery is the best and most permanent cure, in that it removes the organ producing the toxicosis and breaks the pathological chain of this disease.

It is to be hoped that Beebe's serum will some day be perfected and produce more positive results, but at present it is said to be difficult to prepare, and by no means uniform. Some harm has resulted from its premature announcement, as in my own locality many physicians have been waiting for it to be placed on the market as a specific for this disease, and have refused to refer their cases for surgical treatment, except only as a last resort.

At present there exists much diversity of opinion as to the etiology, the pathology, and the physiology of this disease, and the only points we seem to have come to at least a partial if not universal agreement upon are the symptoms, the diagnosis, and the treatment; and fortunately these latter are the most important from the standpoint of the patient and the physician.

If the proper care has been used in the preparation of our

patients for operation, and those cases which are necessarily fatal excluded, the mortality would be exceedingly low.

The Kochers have demonstrated that a preliminary ligation of the superior thyroid artery on one or both sides has not only better prepared the patient to withstand the more severe shock of thyroidectomy, but has also greatly reduced the size of the tumor in the otherwise hopeless cases, and we have had occasion to employ to great advantage this method in several of our worst cases.

To Crile we are greatly indebted for the suggestion regarding the psychic factor in these worst cases of Graves' disease. The operator is justified in telling his patient that the first operation to be done is only a very slight one and that the real operation will be performed later, and that this first step is only preliminary. Of course the friends of the patient should be properly informed of the gravity of the procedure.

One of our patients upon whom I had done a thyroidectomy asked, on the day of dismissal from the hospital, when I expected to do the final operation, thus showing that she had not in any way appreciated the gravity of her condition until all was entirely well.

In the preparation of the patient for operation, we have tried almost every remedy usually recommended to reduce the pulse and better the condition, but none has yielded such good results as absolute rest in bed and tincture of strophanthus.

I have seen cases which entered our hospital with a pulse of 180 and over, in one week or more reduced to below 90. These cases have, in the writer's limited experience of 26 operations for Graves' disease, yielded good results. It is that class of cases where no preliminary treatment seems to be able to make much temporary reduction which seem to be especially dangerous. These usually have an irregular pulse, a degenerated heart muscle, low blood pressure in distinction to the majority, which have often a very much

increased blood pressure, albumin in the urine, or enlargement and fatty degeneration of the liver.

Blood examinations, as so strongly advocated by the Kochers, have not given much satisfaction or aided in determining the prognosis of our cases.

Some operators have suggested the ligation of the inferior thyroid artery, or several of the large veins, to produce by this latter method a passive hyperemia. These procedures are extremely difficult to properly perform, and would probably cause as much shock as a complete and rapid enucleation of the enlarged lobe.

Aside from the proper selection and preparation of the case, the most important thing which concerns us is a rapid and safe technique, suitable to the average surgeon, and not a variety of complicated methods.

While this is a field of work which is not likely to be invaded by the occasional operator, it is nevertheless an operation which should not be dreaded by a surgeon with a fair experience, and should yield results to be compared with other of the newer surgical fields.

The technique employed in my last fifteen cases has been a slight departure from that usually recommended. If the tumor is of the usual symmetrical shape, the collar incision of Kocher is made, but when it seems to be much more on one side and extends high up, a longitudinal incision to the inner side of and parallel to the sternomastoid muscle is made to allow a better access to the arteries which are situated at the two extremes of the tumor.

With the head elevated, in the reverse Trendelenburg position, and a large sand-pillow under the shoulders and neck, the skin is grasped with two pairs of Jacobs' vulcella forceps in the median line, and traction made upward. With Mayo's blunt-pointed scissors, instead of a knife, the skin and platisma muscle are incised, then with constant upward traction the incision is continued around the neck as far as is needed, using the scissors without in any way injuring the deeper structures.

Aside from the greater rapidity, this method causes less hemorrhage in the superficial parts. Next is ligated the anterior veins, and the ribbon muscles of the neck severed high up and retracted, then the capsule opened and the tumor grasped with a stout pair of large vulcella forceps, and traction made in an upward and opposite direction.

This readily allows the operator to wipe off the capsule of the gland with a piece of gauze, and places the arteries and the veins to be ligated on the stretch. Forceps should always be used to clamp rapidly, and these can be placed close upon the tumor and ligated later with catgut after the complete enucleation.

The isthmus is clamped with a large pair of forceps and cut V-shaped, parallel with the clamp, so the raw edges can be turned inward by whipping over with catgut, instead of the usual method of carbolic acid cautery and alcohol, or Harrington's solution.

The wound is washed out with hot saline solution and closed with a sub-cuticular catgut suture. If the ribbon muscles of the neck are large and well preserved, they should be sutured together; otherwise, if they are thin or the patient is not standing the operation well, they can be neglected, as they were in some of our own cases with no noticeable effect.

Drainage through a lower stab wound with large open rubber tube instead of gauze or a cigarette drain completes the operation.

Following operations for Graves' disease, it has been remarkable how rapidly the pulse was restored to normal, and how kindly the wounds healed with little resultant scar.

There has been no class of cases of a serious nature in other fields of surgery which has yielded in our work the large percentage of excellent results as the surgical treatment of exophthalmic goitre.

A CONSIDERATION OF THE MORTALITY IN ONE THOUSAND OPERATIONS FOR GOITRE.

By C. H. Mayo, M.D.,
Rochester, Minnesota.

In the conquering of serious diseases by surgical measures it is important that the operation itself should be as free from mortality as possible. This is especially true when it concerns diseases that have a low mortality, no amount of deformity or discomfort being weighed against possible death from operation. Once that surgical technique and judgment renders the operation comparatively safe, former serious procedures are chosen as operations of expediency; thus we are able to group together the mild and the serious, and the operative mortality becomes still lower, and more attention is devoted to reducing disability and increasing the permanency of cure.

In a country of such enormous territory as ours, over which goitre is quite generally though not extensively distributed among all classes of people, it is still considered a rare disease and only of a serious nature when operated upon. The advice of the old family physician is still respected by many patients, to the effect that if they were operated death would probably result, or should they recover they would run the risk of developing some hideous skin disease, "myxedema," or that they might become "foolish," the latter warning usually being quite effectual in helping them determine as to their procedure.

It is true that in the early surgery of goitre in this country the mortality was high for the number of cases operated

upon, as usually the operations were of great urgency or necessity, especially in the cases of so-called "exophthalmic goitre" (hyperthyroidism), and only the very worst types were sent to the surgeon, these often in a nearly moribund condition after the delay of a long-continued and oft-changed medication. To mention these conditions is merely to indicate what can be said of diseases of the stomach, liver, prostate, etc., a brief detail of increasing knowledge in the development of surgery.

Operations upon colloid, simple or diffuse adenomata, and upon encapsulated adenomata, as a rule, involves but slight risk to the life of the individual. Many patients who are so afflicted wish to be relieved of the deformity, tracheal pressure, and hoarseness, or possibly a severe neuralgia. But from the examination of a large number of varied tumors of this nature, we must say that despite the enormous discomfort and suffering with which the disease may be accompanied, actual death occurs but rarely, and then only from intrathoracic or from malignant or degenerative change in the gland. We have had a number of large goitres exceeding twenty inches across the front of the neck and tumor from one side to the other. One tumor measured thirty-one inches in circumference, including four inches of the back, the only free portion of the neck.

In our series of cases there were in all 574 cases of simple, colloid, or diffuse adenomata, including encapsulated goitre, adenoma, and cyst adenoma, including also four operations for accessory thyroids in the lines of development, one being a lingual thyroid. All were treated by extirpation or enucleation. Two operations were incisions and drainage of acute inflammatory conditions. There were four deaths in this series, one being from lobar pneumonia on the eighth day, another from two severe delayed hemorrhages, one from shock, in which we found brown atrophy of the heart, fatty infiltration of the liver with gallstones, and one from septic pneumonia on the fourth day.

In another great class of cases we use the term "hyperthyroidism" because we believe it will come into general use in describing a condition which manifests such varied symptoms, and it is probable that then earlier relief will be given to many who are now treated for heart disease, nervous disease, gastric crisis, and intestinal toxemia, until a projecting eyeball or goitre becomes sufficiently prominent to attach the label of Parry's disease, Graves' disease, Basedow's disease, or exophthalmic goitre to the unfortunate individual who must then run the gauntlet of the enormous variety of therapeutic agents which are good for the disease when properly christened.

It is quite probable that many cases of hyperthyroidism never progress beyond the early stages, and are not diagnosticated as such, and it is probably true that many cases in advanced stages of the disease get well with, without, or in spite of treatment. We believe that one-fourth the number do so. Yet in hyperthyroidism, Ewing and MacCallum, and especially Wilson's report of 294 cases,[1] show a definite change in the structure of the glands in this type of disease, and the results from the reduction of secretion are certainly almost marvellous.

In our early surgical work in hyperthyroidism, beginning some fifteen years ago, only the most desperate cases were thus treated, and we considered results up to the average which gave 25 per cent. mortality in the first 16 cases. One of these fatalities occurred on the table. Better judgment in selecting a favorable moment for operation, with more careful preliminary preparation of the patient, and there were but three deaths in the next 30 operations for the disease. In this connection I might say that during the last two years 6 cases coming to us from a distance died a medical death between the fourth and ninth day after reaching the city, their inoperable condition being recognized because of former

[1] American Journal of the Medical Sciences, December, 1908.

experience. Fortunately we were able to compare the autopsy reports of these cases with conditions which were observed in deaths following surgical procedures upon the gland. In all of those who died the reports were to the effect that there was degeneration of the heart muscle, fatty liver, soft spleen, and chronic nephritis, and usually enlarged thymus. One very marked case dying without operation the fifth day under observation had no palpable thyroid gland, yet the autopsy showed it to be enlarged and weighing over three ounces.

The various degenerative changes in the gland with increased cell activity has explained why in advanced and delayed cases with what might almost be called "terminal degenerative conditions," the mortality is not only increased, but also why a satisfactory cure does not follow in many instances where great operative skill has avoided mortality. Such cases should be compared to the removal of a bullet from the body with the expectation of obtaining relief from all injury caused by its passage.

There were 405 cases of marked hyperthyroidism operated upon with 19 deaths. Most of these (three-fourths) were treated by extirpation of one lobe, usually the larger right, and the isthmus, and sometimes a part of the left being removed. Occasionally an adenomatous condition could be enucleated. In the early stages of the disease very mild cases were treated by ligating arteries and veins at both upper poles, which represents about one-fifth of the ligated cases. Nearly all of the others operated upon in this manner were the worst possible type of cases which could be chosen, and the operation was done only as a preliminary treatment in preparation for the removal of a portion of the gland later. In the most aggravated cases, where there is dilated heart, edema, and ascites, preliminary preparations were frequently prolonged for several weeks before the operation could be undertaken. These patients improve quickly under the various forms of treatment, such as medication, *x*-rays, rest, etc., but they may also fail rapidly.

In operating we are careful to avoid periods of gastric crisis or intestinal relaxation, and the operation may be postponed several times, waiting for a favorable opportunity. Some form of operation may be considered beneficial which has for its object the reduction of secretion, either by lessening the circulation by ligation of the vessels, or by removal of a portion of the gland.

There were 97 cases of hyperthyroidism treated by double ligation of the superior thyroid arteries and veins, with 1 death, and 14 cases of ligation of the superior thyroid and vein of the remaining lobe, after extirpation of one lobe and isthmus was found to have improved the patient, though not to a satisfactory extent. There were 295 cases of removal of more or less of the gland, with 18 deaths, 7 of which occurred in the first 46 operations. One of these deaths occurred on the table from shock, 15 from hyperthyroidism, nearly all within twenty hours after operation, 2 from embolism, 1 pulmonary and 1 cerebral.

After all has been said concerning the various dangers from operating for ordinary adenomatous goitre, we consider hemorrhage, either primary or delayed, with the efforts made to control this usually accidental condition, as the prime cause of death. Delayed hemorrhage occurs usually from including some muscle fiber in the ligation of the superior thyroid artery. Fortunately, patients operated upon for the various forms of adenomatous goitre are almost always able to withstand serious hemorrhages. The occurrence is far more serious in the extreme cases of exophthalmic goitre with degenerated and dilated heart and other complications associated with such conditions, although hyperthyroidism, with a continuance and increase of all symptoms, is usually the cause of death in this latter form of the disease.

As to the dangers from injury or removal of the parathyroids, we believe that with ordinary precautions, and with the modern operation, such a result may be expected about as often as pulmonary embolism may be looked for in

abdominal surgery. The danger of such injury will seldom occur in operating for exophthalmic goitre, but care must be exercised in preserving the posterior capsule in the operation upon colloid goitre, in which both lateral lobes of the thyroid are attacked at the same or separate periods.

Cancer and sarcoma of the thyroid are most serious conditions. In the early stages of both a cure may be possible, but it will usually be in the unsuspected case. Cancer of the thyroid, which has progressed so far as to be readily diagnosticated, is practically incurable. Inasmuch as goitres of long standing may become malignant, and that in such cases the change is usually accompanied by rapid, irregular growth of a long stationary gland, as a rule with loss of weight and other symptoms of irregular hyperthyroidism, it is proper to state to individuals thus affected that an operation should not be long postponed.

In the series there were 18 cases of cancer, with 1 death, which was occasioned by tracheal collapse from softening of the rings, and 2 cases of sarcoma, with no mortality. There were fully half as many patients with malignant thyroids who appeared too late to derive any possible benefit from a surgical operation, and it was not, therefore, advised.

In the after-care of patients, all but the simplest cases receive a quart of saline rectal enemata given very slowly immediately after the operation. This is repeated in a few hours, and in extreme cases again ten hours after operation. Should there be intestinal relaxation, as in extreme cases of Graves' disease, subcutaneous use of the saline is substituted for the rectal method. Morphine is employed for extreme restlessness. Cold over the pericardial region in marked palpation seems to be of benefit, and if exhausting perspiration is a sympton, it is controlled with repeated small doses of atropine.

The anesthetic given has been ether, preceded by atropine, $\frac{1}{120}$ grain, and morphine, $\frac{1}{6}$ grain. Only 20-odd operations were made under cocaine anesthesia.

DISCUSSION ON THE PAPERS OF DRS. WATHEN AND MAYO.

Dr. J. Shelton Horsley, of Richmond, Virginia.—It has only been in the last few years that the pathology of exophthalmic goitre has been sufficiently settled to justify any routine method of surgical treatment. Six or seven years ago the Jonnesco operation, excision of the cervical sympathetic ganglia, bade fair to become quite popular. I have had experience in one case in which I removed the middle and superior cervical sympathetic ganglia on one side for exophthalmic goitre, and the patient improved, and, I thought, was cured; but a relapse soon occurred, and the patient at the end of two years was in almost as bad condition as at first. Discussion has pretty definitely settled the point that the benefit from such operations was due not to the cutting off of any of the lymphatics or interference with absorption, so far as the lymphatics are concerned, because I do not believe the thyroid secretion is absorbed in that way, but by interference with the secretory nerve fibers, in that way producing a smaller amount of thyroid secretion than would otherwise occur and so lessening the symptoms.

There is but one surgical treatment for this condition, and that is to remove the gland itself. Other methods of treatment may be followed by temporary benefit, but almost invariably the symptoms will recur if the gland itself is left.

As to the anesthetic, I am glad that Dr. Mayo gave his opinion because he is an authority upon such a subject. Theoretically, it would seem as though a general anesthetic, such as ether, would be contra-indicated in bad cases, because we know that ether circulating in the blood is an irritant, and any gland that is irritated has at first an increased secretion, as a rule. So we would naturally expect that the presence of ether in the blood would increase the secretion of the thyroid gland for a while, and that this increased secretion would probably make matters worse—at least, temporarily. This is offset by the partial removal of the thyroid. But I should think that a general anesthetic, in case the thyroid is not removed, might prove disastrous.

Dr. Herman Tuholske, of St. Louis, Mo.—I do not feel that I can let the opportunity pass without saying a few words on this subject, which has been presented in so masterly a manner by Dr. Mayo. There is no question, from what I know of his work and from personal observation of it, that so far as operative procedure is concerned, he has struck the keynote of what at the present time is the ideal operation which will produce the best results. I want to mention one point, and that is, some time ago, after considerable experimentation on lower animals, I came to the conclusion that if we could keep the thyroid gland, which has an important function to perform in the human body, and bring the hypersecreting gland back to a normal or nearly normal condition, we might get rid of the symptoms, keep the gland to prevent deformity, and leave it to functionate as much as necessary in the human body. In a paper I read before the Surgical Section of the American Medical Association, after having observed a number of cases and done that on a number of animals, I came to the conclusion that by the ligation of all veins of the thyroid we might get up a Bier's hyperemia, or a passive hyperemia; that we would first get edema of the gland, a hypernutrition of it, as it were, and possibly get the gland to assume its normal condition; that after an increase of the connective tissue there would be a gradual decrease of it, so that, first, the edema, the result of the ligation of the veins, then a gradual reduction on the cellular elements of the gland to a condition of normality, then of the connective tissue until we might get the gland nearly normal without having to remove any part of it. I said in my paper before the Surgical Section of the American Medical Association and at that time I had only one case, that I would watch it and would at some time report as to whether there is anything in that operation, and whether it would encourage me to pursue it in other cases. I want to say now, that in the same week I operated upon a patient for exophthalmic goitre in whom I removed one lobe and the isthmus in the manner described by Dr. Mayo, and in the same week I resorted to complete ligation of all veins. Since these operations I have had both patients under constant observation. The patient for whom I resorted to ligation of all veins came to me with a pulse of 180. Unfortunately he had been in the hands of a physician who gave thyroid extract

to cure the hyperthyroidism. After a while his pulse declined to 160, and I performed that operation. His oxophthalmus has disappeared. All crises of the stomach and otherwise have gone. His face looks that of a normal man. The palpitation, noticeable at all times when he was lying in bed or being about has disappeared. When he awakes in the morning his pulse is between 65 and 70, and when walking to my office he has a pulse of about 75. He declares himself to be well, but I don't believe it, for when I question him a little, when I think he has done something he ought not to have done, or when I talk to him, his pulse will run up to 85 or 90, and he is still a neurotic subject, which I am willing to attribute to the thyroid condition. The thyroid gland was equally large on both sides; but on the left side it is now so small that it is difficult to make it out. The isthmus is fairly normal. The right side is somewhat larger than normal, but in toto he has no more thyroid gland than any one is entitled to have. The patient from whom I removed one lobe of the thyroid and the isthmus at the same time is living in the same suburb, near St. Louis, and they come to my office together quite frequently. Both have a linear scar, and both believe they are well. I believe the man whose veins I have ligated is a little better than the one whose thyroid lobe and isthmus I removed.

Of course, one swallow does not make a summer, and one operation of that kind does not mean very much; but I have indicated a desire to do a conservative operation, that is, the non-removal of an organ which the patient needs. Whether I will ever do many of these operations will depend upon the next case. I shall not operate on a second case in that manner until the first case progresses sufficiently to justify its repetition. When I am clear on that point, I shall operate on two or three cases and watch them carefully, and after having operated on a number of them it will be worth reporting the whole series.

I certainly felt timid in reporting one case, but I have done it simply to show the line of thought I am following, otherwise I am doing the operation of removal of one gland with the isthmus, and sometimes a little more than it appears necessary, and for exophthalmic goitre this is the operation, with perhaps preliminary ligation of the superior thyroid arteries if necessary.

Dr. Miles F. Porter, of Fort Wayne, Indiana.—I would like to make a suggestion, although I have nothing as yet to back it up with, except theory, and that is, the advisability, in these cases of exophthalmic goitre that are too sick to operate on, of using hot water (boiling water) by injection. Theoretically, it seems to me to be advisable, and in the first case that offers the opportunity I am going to use it. I do not believe the injection involves any danger. I do not believe there is any danger of absorption after the injection, because if the injection is hot enough it would prevent that, and it occurred to me some time ago that this offered a method of curing those cases that we find almost too low for even the ligation of the vessels.

Dr. Wathen (closing the discussion on his part).—I had the pleasure of hearing Dr. Tuholske's paper when it was read before the Surgical Section of the American Medical Association in Chicago, and after I returned home I had one case in which I was tempted to carry out his procedure. While it may be indicated theoretically, it is only applicable to one case in a thousand. It was harder to ligate the veins than to do an enucleation.

In exophthalmic goitre we have not simply hypertrophy of the normal thyroid gland, but a true pathological condition developed the same as when we have a tumor anywhere else in the body, with an entirely distinct histopathology to study, and for this reason it should be treated in the same way by complete removal. Unless there is complete removal of the diseased part of the gland we have an organ that is liable to degenerate into cancer, and, at the same time, produce profound toxicosis.

I would like Dr. Mayo to answer a few questions, in his closing remarks, that have occurred to me in his paper. (1) I would like to know the nature of the changes that have occurred in the goitre itself after ligation of the superior thyroid artery. (2) What would be the symptoms of early malignant goitre, or what would be the differentiation between the early stage of malignant goitre and ordinary exophthalmic goitre? (3) In regard to cerebral embolism, what would be the difference in effect if the superior thyroid artery was ligated close to the gland or at its origin from the external carotid, knowing as we do from the recent work of Crile and others, the relation a ligature placed on the

different portions of the blood-supply in the neck would have toward the formation of cerebral embolism as in enbloc operations in the neck?

Dr. Mayo (closing).—The question of the parathyroids is an important one, and yet I would not attribute to them anything like the importance that has been attributed to them in the writings of the last two years. Here we have a number of little glands, usually two on each side, varying in size from a grain of wheat up to the size of a bean. They are not only very irregular in numbers but in size, in distribution, in blood supply, and so I cannot say that Nature has taken proper care considering the importance attributed to them. The thyroid is a little gland weighing from an ounce to an ounce and a half, having the same blood supply as the brain, coming off at the division where the internal carotid does, coming off at the thyroid axis, we have here a gland that is important. You could not examine it without recognizing its importance, it having almost one-sixth of the blood supply of the entire brain.

In these cases, when the gland loses its duct, it means extra work thrown on the lymphatics. A good many people do not have enough lymphatics to carry away the secretions.

The simplest type of degeneration is the colloid. When the thyroid secretions are retained, we have colloid degeneration, which is due to retention of secretions, so that one individual may develop a large colloid goitre which she retains for many years, and suddenly under the stress has an extreme case of exophthalmic goitre develop in the existing simple goitre.

These are interesting cases, and this subject is one we should keep working at as best we can. Look for albuminuria and eclampsia if the mother's thyroid is not enlarged during her pregnancy. The short bones are developed by the hormones of the pineal gland, and the long bones by those of the thyroid. It has to do with the hypophysis, the thymus and the parathyroids, so that the parathyroids in turn have to do with the development of the calcium salts. Thus, you see, one thing leads to another, and we cannot tell what is first in the chain. Take the old idea of the removal of the sympathetic ganglia. The reason why the removal of the sympathetic ganglia afforded benefit only temporarily was because it was impossible to get them

out as thoroughly as one would like to do without interfering with the return lymph flow to the thyroid gland, and that when it was re-established the symptoms came on again.

As to where we shall ligate the arteries, I had a case recently which looked, in a general way, like a bad case of exophthalmic goitre, but which improved temporarily after ligation of the superior thyroid arteries, and then after a few weeks relapsed into the worst possible condition, coming to me with edema and with an extreme form of Graves' disease. I re-operated because it seemed as if I felt pulsation in these two superior thyroid arteries, which were supposed to have been ligated. They were ligated high up close to where they come off from the division of the carotid, the anastomotic line from the inferior thyroid, was still delivering blood to the superior pole. We should crush the upper pole or ligate close to the division of the thyroid, so as to close the current of delivery to the upper pole.

A girl comes to you who is not a bad subject for the re-removal of the thyroid in the early stages. You may make a diagnosis of exophthalmic goitre without trouble, but she is hardly bad enough for you to remove one-half of the gland, and so you ligate the arteries, instead of putting her on all kinds of treatment, simply to see if she gets better, and sometimes you can accomplish in ten days as much as you can in weeks and months by other methods of treatment.

With reference to the bad cases, I have had many such instances. I recall one patient, whose case was a bad one, who gained forty-six pounds in four months after ligation of the arteries. Some of these cases, therefore, do improve after ligation; but one died within twenty-four hours following simple ligation of the arteries, because I could do this easier than enucleate the gland. Were it possible for me to treat again the patients I have lost, I venture to say half of them would be alive today. Some of these patients might do well under hot water injections, which have been referred to by Dr. Porter. In injecting the tumors, angiomas, etc., it is possible we do not get the water hot enough; but before injecting one of these patients I think I would first try it on the dog.

The changes are often remarkable after the ligation of the arteries, although many patients have come back to me at a certain time for the removal of a part of the gland,

looking so well that I did not recommend any operation, as they were as well as they could have been from thyroidectomy.

As to malignancy, in these cases of long, stationary goitre, which grows irregularly, becomes dense, and restricted in its movements, with exophthalmic symptoms, irregular pulse, emaciation, look out for malignancy. It is hard to tell, but when you can positively tell, you may as well let them alone.

OPERATIVE TREATMENT OF TUBERCULOUS JOINTS.

By H. J. Whitacre, M.D.,
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The treatment of tuberculous joint disease has long been a disputed question, and the profession is not today agreed upon a uniform plan of action.

Many methods of treatment have been advanced, and these methods have been supported and re-supported by long series of statistics and by thoroughly creditable reports of results.

When the complete review has been made it seems to me that we must conclude that there is no one correct line of treatment for tuberculous joint disease, but that the method selected must depend upon the nature and stage of the lesion, the age and social position of the patient, facilities for treatment, the individual experience of the physician in charge, or that results must be accomplished by a combination of all available methods.

Treatment by rest, diet, and favorable hygienic conditions, by Bier's congestion hyperemia, by iodoform injection, by vaccine therapy, and by cutting operations, must each have a definite field of applicability, or must be used in their proper combination.

It is not my purpose to discuss the comparative value of the different methods of treatment that have been advanced, nor does my experience justify me in drawing conclusions regarding the entire field of application of the operative treat-

ment. My experience has been largely confined to the operative treatment of adults who have suffered from this disease. Inasmuch as seven-eighths of all patients who suffer from joint tuberculosis are less than fourteen years of age, it will be readily seen that my experience and results cannot justify general conclusions.

Twenty-five patients have come under my care in whom the operative treatment has been used, and it has seemed desirable to me to report the results in these cases as a contribution to the general subject.

Of these, 13 have been in the knee, 7 in the ankle, 3 in the elbow, 1 in the wrist, and 1 in the hip. Inasmuch as a fairly uniform method of procedure has been used in these cases, I wish first to describe the operative technique in each joint.

In the knee-joint the incision is uniformly made from condyle to condyle across the centre of the patella, the lateral quadriceps expansions are divided, the patella is sawed through, the knee is acutely flexed, the fragments of the patella are drawn upward and downward, and a complete exposure of the ends of both bones and of the entire joint is obtained. A correct estimate of the nature of the lesion can now be promptly obtained, and the points considered are (1) bone involvement; (2) extensions outside the joint into the soft tissues. A tourniquet is always used for the purpose of giving a bloodless field for accurate dissection.

My experience includes an unusually large percentage of purely synovial cases (15 out of 25), under which heading I would include those cases in which there is merely a superficial erosion of bone. When the case is of this type, a sharp knife dissection begins in the lower half of the joint, just behind the patella, progresses in a systematic manner, and removes the synovial membrane, together with all thickened tissue, out to the quadriceps aponeurosis.

When the dissection reaches the head of the tibia, a heavily bladed, yet sharp, knife is used and the bone is pared, not

only around its borders, but over the upper surface when the articular cartilage is diseased or loosened from the bone.

When this dissection reaches the posterior border of the tibia, it is discontinued for the time being. The dissection then begins first on one side, then on the other, then between the condyles, and all tuberculous or suspicious tissue is in the same manner dissected around the head of the condyles to the popliteal soft tissues.

When this point has been reached, the bones can be much more freely separated than previously, and the same sharp dissection is continued over the entire posterior portion of the joint, particular attention being given to the posterior border of the tibia.

Caution must be taken in this part of the dissection not to injure the popliteal structures. When this part of the dissection has been completed, the upper fragment of the patella is drawn strongly upward and the quadriceps bursa is accurately dissected out. In some instances this cannot be completely accomplished without a lateral longitudinal incision at the outer border of the patella. Any superficial erosion of either bone or small area of necrosis is cut out with a sharp knife, never with a curette. Indeed, a curette is never used in this operation unless there should be a sinus or cavity extending into the soft tissues in such a way that free incision and dissection is impossible. The curette necessarily mashes the tissues and exposes the patient to the risk of having tubercle bacilli jammed into deeper tissues, which are left behind. I would make a special point of clean cut, sharp dissection with a knife. A most careful search is always made for bone foci or minute sinuses extending into the deeper bone structures. The bone paring is always made down to perfectly healthy bone.

When there is a focus of bone tuberculosis, whether in the head of the tibia or in either condyle, and the focus is not of a size sufficient to necessitate the removal of the end of the bone, the area is likewise excised by cutting around with a sharp

knife well below the deepest point of the focus, then a sharp gouge is used to lift out this cylinder or cone of bone tissue. I consider this decision as to the extent of bone involvement a heavy responsibility and one not to be undertaken until careful microscopic study of such tissues has justified a fair degree of accuracy in such judgments.

When the dissection has been completed, pure carbolic acid is swabbed over the entire area of dissection and left in contact with the tissues for three minutes. Alcohol is then applied to neutralize the carbolic acid. The entire dissection has been conducted the same as is followed in malignant disease.

When cavities are left in the bone these are carefully dried and filled with Moorhof's iodoform bone plugging mass, which is allowed to harden. The tourniquet is now removed, all bleeding points are secured, and the wound is ready for closure.

Conservatism in the removal of bone has been my rule in all these operations, and the end of the bone must be very seriously damaged to justify sawing it off. These patients in whom erosion or atypical excision is done, heal as satisfactorily as after a typical excision, and the function has seemed to me so much improved by maintaining an extremity of normal length that I consider this to be a very important point. Those patients who have not had bone removed get along almost without a limp. Indeed, one young lady whose occupation was that of elocutionist has continued her professional work on the New York stage and very few people know that she has a stiff knee. Even her manager did not know this fact until he saw her going upstairs.

Bone foci of considerable size can be cut out and filled in with iodoform mass without great sacrifice in the length of the bone. In Case 10 the upper surface of the tibia was sawed off in an excision and the focus was seen to extend much deeper into the head of the tibia. When this focus was removed a cavity was left which was, I think, about the

size of an egg. This was carefully filled in with iodoform mass. This patient has had perfect recovery and has a solid, well-healed leg.

The wound is usually closed with interrupted No. 3 plain catgut. In excisions two chromic gut sutures are usually put into the bone through drill holes to maintain position until the splint can be applied. The patella is not wired, since a heavy suture on either side and suture of the soft tissues in front are usually sufficient to maintain the apposition. A drainage tube is regularly placed on one side or the other to take care of the blood and serum for the first three to seven days; then it is removed. A strip of sheet rubber or gutta-percha tissue is usually placed on the opposite side of the joint for a similar reason and left for the same length of time.

After the wound is closed dressings are applied in such a way as to facilitate subsequent change. Plaster-of-Paris bandages, four to five inches wide, are then made into a strap long enough to extend from the gluteal fold to the tips of the toes. This strap is made of about twenty layers of gauze, and a heavy piece of strap iron about eighteen inches long is included. This re-inforced plaster-of-Paris strap is then placed on the posterior surface of the extremity, which has been well wrapped with ordinary splint cotton, then plaster-of-Paris bandages are used to make an encasing splint which extends from the perineum to the tip of the toes, but does not include the knee.

When a sufficient number of turns have been made to give solidity, a second strip of hoop iron is placed on the anterior surface. This strip is bent in such way as to make a high arch over the knee, the arch being six to eight inches broad at the base, and the strip is curled up at each end to make a hook. More plaster-of-Paris bandages are now rolled on to incorporate this anterior iron strip. When the splint is completed and the plaster hardened immobilization is complete, the arch at the knee gives free access to the wound and the hooks at either end together with the arch at the

middle give three points from which the entire extremity can be suspended by rubber cords to a longitudinal bar which is placed over the bed. This swinging position adds greatly to the comfort of the patient.

The wound is dressed on the third day, drainage removed on the fifth to the seventh day. The sutures are removed on the tenth day; the wound is healed, as a rule, in three weeks. The splint is removed in three to five weeks and replaced by a simple encasing splint which extends from the ankle to the middle of the thigh.

Bony union is often very slow, and may not be complete until eight to twelve weeks after operation.

THE ANKLE. By far the best exposure of the ankle-joint is given by an anterior incision which extends from one malleolus to the other directly across the instep. I have sometimes modified this in such a way as to make an anterior skin flap extending somewhat downward on the dorsum of the foot and have divided the tendons and other structures on a higher level, yet both methods seem to be efficient. The incision extends first through the skin and subcutaneous tissues, the tendons are exposed, and sutures are placed well above and below the point of division in each tendon and so marked that identification will be easy when they are to be re-united. The ligaments and other surrounding tissues are now divided and the joint opened. The same careful dissection is now instituted as has been described for the knee, and every vestige of tuberculous tissue is most carefully removed. Particular attention must be given to the calcaneo-astragaloid articulation, which is frequently secondarily involved, and may be the primary focus of infection. Whenever the patient complains of great pain in standing and inability to walk, this joint is probably involved.

In Case 20 it became necessary to remove practically normal astragalus in order to thoroughly expose and dissect out this joint. Attention is likewise called to the great importance of the tibiofibular articulation. This articulation

must be thoroughly exposed, since it is regularly involved. When cavities are found in the astragalus, os calcis, tibia, or fibula, they are cut out with a sharp knife and the cavity filled with iodoform mass.

After the dissection is completed the joint is treated with pure carbolic acid and alcohol, the tourniquet is removed, vessels secured, and the joint closed. The dressings are applied in two sets, one on the anterior surface, which can be removed without disturbing the foot in the cast; the other set are laid in the cast before it is applied. The splint used after this operation is a posterior strap of plaster-of-Paris which has incorporated within it a strip of hoop iron, then several rolls of plaster bandage are put on as an encasing splint, or an anterior strap is first applied, then the circular turns are used to hold the anterior and posterior straps in place. This joint is likewise treated by tube drainage for from five days to one week. The after-treatment of the ankle is practically the same as in the knee. The results in this joint, as in the knee, are much more satisfactory when a mixed infection has not taken place.

The Elbow. The elbow-joint is best exposed for careful dissection of all the ramifications of the synovial membrane by posterior incisions. A longitudinal incision is first made along the inner border of the olecranon extending about two and one-half inches below and three inches above the tip of the process. A second transverse incision is then made on a level with the radio-humeral articulation, and extends from the first incision to the outer border of this articulation. The longitudinal incision extends through into the joint. The transverse incision is first made through the soft parts, then with a chisel or saw the olecranon is divided on a line with the superficial incision. This gives a flap above, which includes the olecranon, the triceps muscle, and overlying skin. This flap is retracted upward and strong flexure of the elbow causes the three bones to stand out distinctly. Careful attention must be given to the ulna

nerve during this flexure, and it may be necessary to do a subperiosteal dissection beneath the nerve and lift it over the inner condyle, or to chip off the inner epicondyle, before completing the flexion.

The dissection of the synovial membrane is now carefully completed in the same manner as has been described for the other joints, great care being given to the radio-ulnar articulation.

The joint is closed with drainage and all parts are sutured back into position. The olecranon is re-united with gut, which is used in the soft tissues only. A strap plaster splint is applied with the elbow at a right angle. The after-treatment of this joint differs in no way from that given for the knee, except that I have endeavored to get motion in this joint and begin with gentle movements about three weeks after operation.

Detailed case reports cannot be included in this paper, and the following *resume* of important points may be of interest.

There were 12 females, 13 males. All except one were of the working class, and were dependent upon their own or their parents' daily labor for support.

There was no family history of tuberculosis in 19 cases. There had been a definite injury to the joint in but 7 cases. The duration of the joint trouble ranged from five weeks to twenty-one years. In 15 cases it had been more than one year. The general health was bad in 10, fairly good in 6, good in 9. There were tuberculous lesions elsewhere in 5 cases, 1 in lung, 1 in opposite knee, 1 in opposite ankle, 1 in Fallopian tube, 1 in spine and lung.

There were three children whose ages were six, seven, and fifteen. The ages of the remaining patients varied from eighteen to forty; 3 were under twenty; 13 were between twenty and thirty; 6 were over thirty. There were no sinuses present in 19 cases.

Some of these cases have been reported incompletely in

a previous paper, but are included in the present report in order to give the conditions of the patients today.

Twenty-five cases are reported. Of this number, 18 may be considered to justify a conclusion as to the cure of the disease. It would seem justifiable to consider a case cured when the wound has healed and remains healed and painless for many months and when the extremity has been restored to its function for a sufficient period to justify the conclusion that it will be permanent. I realize that exceptions may be taken to such conclusion, and that a much longer period may be demanded by some.

Of this number, 12 are completely cured and are using the extremity without support in their ordinary duties. Two have a single persistent sinus of minor importance, but have good function. The result is not known in one, but the progress was favorable up to the time of her disappearance one year after operation. In 3 the extremity was amputated subsequently, but the author is not convinced as to the justification for amputation in 2.

In the remaining 7 recent cases, the wounds have healed satisfactorily, the primary result is good, and a cure is confidently expected in all, but a sufficient length of time has not elapsed since operation to justify a report of final results.

In the 3 cases amputated, 2 showed extensive and extreme destructions of the joint at the time of the excision, and the general condition of the patient was bad. Excision became in these cases a trial measure of conservatism. There were other cases in this list, however, in which that joint seemed to be quite as extensively involved, cases in which amputation had been advised, yet excision and erasion accomplished a cure.

Seven erasions, or, more properly speaking, atypical erasions, have been done in the knee, 7 in the ankle, 3 in the elbow, and 1 in the wrist.

No flexures have developed, and useful motion has been developed in 3 knees and 2 elbows. The motion is perfect

in 1 elbow. The motion in the other cases is slight, varying from 10 to 25 degrees, but is much prized by these patients. The endurance in the recovered cases seems good.

In 1 case a secondary operation was necessary, and in 2 I have cured a persisting sinus by local applications and without the use of a general anesthetic. I do not know what might have been indicated in the cases amputated.

There have been no deaths from operation. No case has developed tuberculosis elsewhere by metastasis. Case 5 showed some pulmonary symptoms for a time within a year after her operation, but they were never clearly tuberculous, and I believe that we may safely assume that they were not from the fact that they disappeared promptly and the girl has remained in perfect health. Case 1 had the physical signs of tuberculosis at the time of her operation, but these signs disappeared and she has been in excellent health for almost four years since operation. Case 16, an ankle in which amputation was subsequently performed, suffered from tuberculosis elsewhere at the time of her operation, and died of tuberculosis of the bowel. This patient was in wretched health as a result of generalized tuberculosis, and the bowel condition developed more than one year after operation.

The operative method of treatment has been recommended and adopted in these cases for a variety of reasons. In many it has been adopted after a careful application of the accepted non-operative methods of treatment. In Case 7 the patient has been under treatment by competent men for eight years, yet she came to me on crutches. In this case I found such marked evidence of pelvic tuberculosis that I first operated upon the abdomen and removed a tuberculous right Fallopian tube. I then used immobilization and Bier's congestive hyperemia on the knee for a period of almost six months without the slightest improvement. At the time of operation the inner one-half of the joint showed an active fungus tuberculosis. The outer half showed well advanced healing

within the joint, but the outer portion of the tibia immediately beneath the healed portion of the joint showed an active bone focus the size of the last phalanx of my index finger. Again, in Cases 18 and 19 under long continued treatment by rest and favorable hygienic conditions the joints grew worse or failed to improve.

In other cases operative treatment has been recommended because of the seriously destructive nature of the lesion at the time the patient came for treatment.

In a third group of cases the social position of the patient has demanded an early restoration to a wage-earning capacity, and after a thorough explanation of the situation the patient has selected the operative course.

DISCUSSION.

Dr. C. E. Caldwell, of Cincinnati, Ohio.—I am particularly interested in this subject, and the more so because the paper, as read by Dr. Whitacre, shows a line of procedure which differs considerably from that which it has been my custom to adopt in these cases.

I am always pleased and gratified to learn another man is getting successes with a procedure with which I have gotten nothing but failures. I am always willing to learn from another, and therefore I say, it is gratifying to learn that Dr. Whitacre is getting successes along this line of work which has in my hands led only to one conclusion, that of determination in all these cases to resort to more radical measures. There may be something said perhaps *apropos* of the fact that my service is connected with a city institution in which cases come in a more advanced condition of disease than those who usually present themselves in a service such as Dr. Whitacre has.

With regard to the pathology of these lesions, I am convinced in my mind, and that conviction is based largely, too, upon pathology and on the observations of such a man as Ollier, that a negligible proportion of cases of tuberculous joints are synovial in their type. I am convinced that the bone lesion in the vast majority of cases, however minute it

may be, is the primary lesion; that the synovial membrane is affected by reason of its close proximity to the margins of the cartilages, and if you will examine these cases you will find there is beginning slight erosion of cartilage, and in certain cases I have operated and found in my own mind hardly justification for a radical procedure, that of resection, yet believing in a bone lesion I have proceeded to a resection of bone. It seems to me, that there is no disadvantage from this because I have repeatedly in a number of cases made several sections of bone in the same joint. If a man saws rapidly there is very little traumatism, and a small piece of bone, about one-quarter of an inch, may be taken off, giving a perfectly plain surface. Speaking of the knee-joint, in resection almost invariably, even where the cartilage was intact, I have found a focus of bone lesion and if that focus was sufficiently large and the curette showed it dipped down deeper in the bone, I have not hesitated to apply the saw again and remove another segment of bone. The bone is so soft, as a rule, in these cases that it takes but a few seconds to saw it through. The patient does not suffer, and I have removed sometimes three sections, showing the lowest point of the abscess cavity or focus and gotten down to good, plain bone.

With regard to the objections of shortening and disability in the function of the joint, I have under observation now a number of cases that come occasionally to my office of their own free will to show me how they are doing. I know at least, five or six men who are doing things that are arduous in their nature and are going about. Those men have good results and over periods of five or six years, walking constantly, and with very little limp.

Dr. Edward H. Ochsner, of Chicago.—While I fully agree with what the essayist has said on the subject in general, I disagree with him as to the necessity of frequently operating upon tuberculous joints. Ten years ago I operated upon most tuberculous joints that came to me for treatment, but I have become constantly more conservative. Thus, in the past year, in about one hundred acute cases of non-secondarily infected joint tuberculosis, I have not found it necessary to do a single resection. If one will put these patients on good food, fresh air, absolute immobilization, the avoidance of secondary infection, vaccination treatment

under control of the opsonic index, he can not only retain all of the bone, but he can preserve the normal functions in the great majority of cases. We know that the first thing which happens when a joint becomes tuberculous, as the last speaker (Dr. Caldwell) has correctly stated, is usually a tuberculous infarct in the epiphyseal line, which results in a necrosis of the cartilage. The next thing that happens is an effusion into the joint for the purpose of separating the opposing surfaces of the joint cartilages. If we leave this effusion in the joint, if we secure absolute immobilization, there will be no destruction of the opposing cartilage and there will be no subsequent adhesions. I have been able to prove this over and over again. I have had cases that came to me in a desperate condition, one with a temperature of 104° F. and a pulse of 128. This case came to me for amputation of the thigh. He is now walking with a fairly normal joint. I had a very peculiar experience during the past two years which demonstrated to me the reason why such cures are possible. Within a period of three weeks I had three severe cases of bilateral tuberculous cervical adenitis. In each case I operated on the worst side, then put the patient on vaccination treatment, operating on the other side eight weeks later, and in each case found a peculiar condition. While on the first side operated upon the gland capsule was normal and surrounded by a large amount of periglandular tissue, the second side operated on showed practically no periglandular connective tissue after this interval of vaccine treatment. These observations explain in a measure why proper vaccination treatment will prevent ankylosis. The process of healing with vaccination treatment is fundamentally different from the process which we ordinarily observe at the operating table or at autopsy. The process which has here been observed and described is one of sclerosis, of exclusion and starvation of the tubercle bacilli, while when vaccine treatment is properly used I feel confident that many cases heal without the formation of connective tissue by a process of phagocytosis, of resolution. If we can thus prevent the production of connective tissue we may reasonably expect a normal joint, and this has actually been my experience in a large percentage of cases.

Dr. Caldwell.—Is it your experience, Dr. Ochsner, that tuberculous cases run a temperature of 104°? Personally,

I think there is always a possibility, in these cases of high temperature and accelerated pulse, of extraneous infections rather than tuberculosis of the joint. I am not inclined to believe that the average tuberculous case runs such a high temperature, and while I have immobilized joints for months at a time, I have never obtained the results Dr. Ochsner speaks of, and have eventually come to resection in these cases.

Dr. Ochsner.—In the case I mentioned the patient had had tuberculosis of the right knee for twenty-eight months. Eleven months before admission the abscess was incised and drained and shortly after became secondarily infected, thus the patient had not only an old joint tuberculosis, but a severe secondary infection with a temperature of 104° and a pulse of 128. He was placed on the treatment above outlined, the joint was not resected. The sinuses have healed completely and the patient has about 30 degrees of motion. I might cite many similar cases where I have had similar gratifying results.

Dr. George A. Hendon, of Louisville, Kentucky.—There was one feature of Dr. Whitacre's paper that pleased me very much indeed, and that was his condemnation of the use of the curette in connection with tuberculous infections. No doubt the gentlemen of this Association realize the great harm that can be done with this instrument, and of course to them the remarks are not applicable, but, as a matter of fact, this instrument is being used recklessly and in a widespread degree. I think that one of the grossest violences any man can commit against surgical principles is to curette a tuberculous sinus. It would be just as rational and would be just as good therapeutics to curette a cancer.

Dr. Whitacre has emphasized the importance of laying open these lesions and dealing with them in a logical manner, and if he does nothing more than emphasize the harm that can be done with the curette, his paper will have accomplished great good.

Dr. Charles M. Rosser, of Dallas, Texas.—Unfortunately, I did not hear all of Dr. Whitacre's paper, but the trend of the discussion indicates very clearly its purpose. I think there are two classes of cases we must consider, those which come to us at the proper time, before too much destruction has taken place, and those that come later, after great destruction of tissue has occurred.

It has not been necessary for me in the past year, in a series of several cases, to resort to any operative intervention. Yesterday I mentioned casually, in discussing Dr. Murphy's paper, regarding the use of formalin in the pleural cavity, that after some demonstrations which he made last summer in his clinic in connection with the use of formalin in joint affections, the results following the injection of a 2 per cent. and 4 per cent. formalin and glycerine being so entirely satisfactory.

Dr. Whitacre (closing).—I appreciate very much the discussion which has been made on this subject.

In answer to Dr. Caldwell's statement, I wish to say that I estimate carefully the location and extent of a bone lesion, and I feel it is very important for us to remember that a bone which looks bad is not necessarily tuberculous. A bone may look very much congested, blue, and almost necrotic, yet sections will show that it is not of a tuberculous nature. I have borne this matter in mind in making these atypical operations, and I have endeavored to be fair to the patients, and if there have been lesions left behind in these femurs or tibias, they have not given any trouble; and have uniformly been cured.

In answer to the remarks of Dr. Ochsner on vaccine therapy which are in reality a criticism about operating at all, or at least a difference of opinion regarding it, I should like to state that I do not operate on all cases as a routine. That is not my practice, and I have mentioned in my paper enough to convey that impression. However, there are certain cases in which operation is done. It can be shown that some of these cases have been treated by conservative methods for six to eighteen months before operation was undertaken; others have been operated on promptly because of the seriousness of their condition, or because of the urgent necessity that the patient return to work. In some of the cases operated on I hardly see how anything short of a miracle could bring them to prompt and rapid recovery, as is reported by Dr. Ochsner. I have used the usual non-operative methods, but have not used vaccine therapy to an extent which would justify me in arriving at a conclusion in regard to it. Most of these cases have not done well, and I have seen and have amputated in cases where such methods have been followed for too long a time and the joints have rapidly

gone on to destruction. There is no question but that the joints have gone on to destruction and patients have died because they were kept on rest treatment and treated by other methods. Some of the patients reported went to excellent surgeons before consulting me and were advised to have the leg amputated. Jacobson, I believe, has said, in describing the operation for excision of a tuberculous joint, that it is an operation for poor people, and does not apply to the well-to-do. Many of the patients cannot command the time, nor have they the hygienic or dietetic conditions that would be necessary, nor do they remain under one observer long enough for him to accomplish results. In this type of case I can scarcely get away from my duty to restore them to a wage-earning capacity. Many of these joints, which recover so satisfactorily under the methods mentioned, must be non-tuberculous joint infections.

As regards the injection of these joints, I do not see how some of the joints I have operated on could be treated by injection. Let me cite one case, that of a man who had an extensive joint lesion full of fungous tissue; he had a large abscess extending down into his calf, and another dissecting abscess extending up to his thigh, with ramification of pockets filled with tuberculous granulations. There were in reality no cavities. Now, it would be impossible to reach all those compartments of the joint by the injection method.

SPLENECTOMY FOR SPLENOMEGALY OF DOUBTFUL CLASSIFICATION.

By M. C. McGannon, M.D.,
Nashville, Tennessee.

Enlargements of the spleen, without assignable cause have been carefully studied during the last ten years, but the variability of the symptoms presented in the different cases reported has made the actual classification not only difficult, but to some extent uncertain.

Professor Osler, in his monographs upon the subject, published in 1900, in the *American Journal of the Medical Sciences*, in 1902 in the *Transactions of the Association of American Physicians*, and in the *British Medical Journal*, October 17, 1908, has done much to place the subject in a workable light. His proposition is, that all of these conditions, variously described as primitive splenomegaly, splenic anemia, Banti's disease, etc., are all one and the same disease, but observed and described at different times and when different symptoms were present, that is, during different phases of the same disease.

Most recent observers have accepted this teaching of Osler's, which would, from present reports of cases, seem sound; however, so long as the cause of the disease is unknown, the actual disease itself is left uncertain.

In order that we may determine positively whether this disease is primarily one of the spleen, which has for its symptoms all of the other observed phenomena, or whether the enlargement of the spleen and these other associated patho-

logical conditions are due to one and the same unknown exciting cause, having its origin outside of the spleen, it is very necessary that we shall study with care every case of this kind that we may see, and publish accurate reports of them.

The case which I desire to record has some unusual features, not heretofore reported, in connection with primitive splenomegaly.

Mrs. A., white, aged forty-three years, housewife. Came under observation on March 13, 1908.

Family History: Negative.

Past History: Always very healthy. Has lived in or near Franklin, Kentucky, all her life. Never went out of the State until coming to Nashville. Has always been a hard worker. Had typhoid fever at nine years of age.

Head: Negative, except for occasional attacks of neuralgia.

Thorax: Pneumonia at three, seventeen, and forty-two years of age, the last time being on the right side.

Jaundice: Twenty-five years ago, without colic. Never had malaria. Appetite always good; no symptoms of dyspepsia.

Bowels always regular. No hemorrhoids.

Genito-urinary: Negative. Nothing to even suggest syphilis.

Skin always clear; no eruptions; no falling out of the hair.

Present Illness: For the past two years has not had good health. There have been no definite symptoms, but has been lacking in energy; would tire easily and would feel all worn out before the day was much more than half over. In October, 1907, she contracted pneumonia, which was located in the right lung. The fever lasted about two weeks. Her strength returned very slowly, although she was able to get up out of bed in about three weeks after the onset of the disease. It was about six weeks later, however, when she was first able to go out of the house. The cough did not persist, and there was only very slight loss of weight, but she felt weak and listless all of the time.

On January 26, 1908, the patient put on tight-fitting clothes

for the first time since she developed the pneumonia, and she noticed a pain in her left side (in the region of the spleen). She has never been entirely free from pain in that region since. About February 15 she first noticed a lump in her left side coming out just below the ribs. It then seemed to her to be about the size of her hand. She has not noticed any material change in the size of the tumor. Patient says she began to get pale in the fall of 1907, before she had the attack of pneumonia. She now (March 13, 1908) complains of a fulness in the left side, with pain more or less constantly in the left upper quadrant of the abdomen.

Present Condition: Color good (patient says she was more florid before she had the last attack of pneumonia). She is well nourished. Skin soft, though somewhat dry. The superficial lymph nodes are slightly enlarged throughout. They vary in size, from a small cherry to the largest, which is in the left inguinal region and the size of a walnut. (I removed this for microscopic examination. Its enlargement was found to be due to glandular hyperplasia.) Thoracic organs normal.

Abdomen: The left side is filled by a smooth firm tumor, that extends from under the ribs downward to the anterior superior spine of the ilium and across the abdomen to an inch beyond the mid-line. Two distinct notches are easily felt on its free border. This is recognized as the spleen. Nothing else abnormal can be made out inside the abdominal cavity.

Blood count: 4,800,000 reds, 6500 whites; hemoglobin, 85 per cent., leukocytes; mononuclears, 50 per cent.; polynuclears, 50 per cent.

Urine: Specific gravity 1020; acid; no albumin; no sugar.

The patient was sent to the Women's Hospital of the State of Tennessee at Nashville, and was kept under observation for a month. During this time, the chief noticeable change was a gradual drying of the hair and skin; the latter became progressively thickened and puffy, and grew pale and waxy.

The patient's memory became somewhat impaired and her mental faculties gradually clouded to such an extent that she, herself, recognized that she could not think and converse as she was accustomed to do.

On April 7, she consented to a removal of the spleen. On that date the following was her chart record:

Present Condition: Pale, but fairly well nourished. Hair very dry. Skin, dry and harsh. Lips seem thickened and face rather puffy. Thorax negative. Abdomen: Tumor in left hypochondriac region, notched, hard, smooth, evidently spleen. Nothing else abnormal in abdomen.

Blood: Red blood cells, 4,000,000; white blood cells, 9000; hemoglobin, 80 per cent. A moderate grade of anemia, without leukocytosis. The combined large and small mononuclears represent 60 per cent. of all the leukocytes, instead of 28 to 33 per cent., as is normally the case.

On April 10 I removed the spleen. There were some recent adhesions especially about the outer and lower part of the organ. The vessels were enormously enlarged, but beyond these two complications, no great difficulty was encountered in the splenectomy.

Following the operation the temperature rose to 100° on the 11th and 12th, and then subsided to normal. Operative recovery was prompt and satisfactory.

The blood examinations subsequent to the operation, were as follows:

April 11, 1908. Red blood cells, 3,800,000; leukocytes, 35,000; hemoglobin, 75 per cent. Differential count: 500 leukocytes; neutrophiles, 79.4 per cent.; small mononuclears, 16.4 per cent.; large mononuclears, 4 per cent.; basophiles, 0.2 per cent.

12th. Red blood cells, 4,300,000; leukocytes, 37,000; hemoglobin, 80 per cent. Differential count: 500 leukocytes; neutrophiles, 67.2 per cent.; small mononuclears, 26.6 per cent.; large mononuclears 6.2 per cent.

13th. Red blood cells, 4,700,000; leukocytes, 35,100;

hemoglobin, 90 per cent.; neutrophiles, 59.5 per cent.; small mononuclears, 35.5 per cent.; large mononuclears, 5 per cent.

14th. Red blood cells, 4,600,000; leukocytes, 21,900; hemoglobin, 90 per cent.; neutrophiles, 47.8 per cent.; small mononuclears; 47.2 per cent.; large mononuclears; 4.4 per cent.; eosinophiles, 0.4 per cent.; basophiles, 0.2 per cent.

16th. Leukocytes, 22,100; no differential count made.

21st. Red blood count, 4,700,000; leukocytes, 23,000; hemoglobin, 90 per cent.; neutrophiles, 52.3 per cent.; small mononuclears, 42.7 per cent.; large mononuclears, 5 per cent.

26th. Red blood count, 5,000,000; leukocytes, 12,000; hemoglobin, 90 per cent.; neutrophiles, 58.6 per cent.; small mononuclears, 34 per cent.; large mononuclears, 5.8 per cent.; basophiles 1.2 per cent.; eosinophiles, 0.4 per cent.

30th. Red blood count, 4,800,000; leukocytes, 12,800; hemoglobin, 75 per cent.; neutrophiles, 67.4 per cent.; small mononuclears, 24.6 per cent.; large mononuclears, 6.2 per cent.; eosinophiles, 1.4 per cent.; basophiles, 0.4 per cent.

May 3. Red blood count, 5,000,000; leukocytes, 11,000; hemoglobin, 80 per cent.; neutrophiles, 64 per cent.; small mononuclears, 28.2 per cent.; large mononuclears, 5.4 per cent.; eosinophiles, 1.4 per cent.; basophiles, 1 per cent.

Examination of Spleen. It was uniformly enlarged, and measured, in length, nine inches, and in breadth, five inches Its weight was five pounds. It was uniformly of firm consistency, but not hard or nodular. The edge was notched in several places. At first sight it appeared a deep purplish red, but on closer examination it showed a finely mottled appearance due to the presence of small areas, of the size of a pin's head or smaller, that were lighter than the tissues between them. These lighter areas projected very slightly above the surface, giving it a somewhat granular appearance. The cut surface was macroscopically granular, the slightly projecting masses being similar to those showing through the surface.

Microscopic Examination. There was evidence of great proliferation of endothelial and lymphoid cells, as shown by the large number in which mitotic figures were visible. In some areas the increase in connective tissue seemed to be of about the same extent as the cell proliferation, while in other areas, the cell proliferation was greater, giving larger aggregations of lymphoid and endothelial cells, than normal. The splenic corpuscles seemed crowded together and showed some slight evidence of degeneration. This degeneration partook of the appearance of cloudy swelling.

The patient remained in the hospital for a month. During that time she gradually and steadily improved. The enlargement of the superficial lymph nodes gradually subsided. The mental condition cleared. The skin lost its puffiness and waxy look, so that when she went home she appeared to her friends almost like her normal self.

Two months subsequently she was again referred to me, suffering with cholecystitis, requiring drainage of the gall-bladder. At this time the enlargement of the lymph nodes had completely subsided.

The skin and hair was of normal softness. The face was no longer puffy, and its natural wrinkles were no longer obliterated.

It is now eight months since the spleen was removed, and the patient, whom I saw a few days ago, seems in every sense of the term a well woman.

A careful consideration of all the usual causes for splenic enlargement fails to permit of the case just described falling under the head of any of them. Malaria was absolutely excluded. Syphilis could not, by the greatest stretch of the imagination, be considered, and tuberculosis was not possible. Hodgkin's disease was excluded by the condition of the lymph nodes, and blood examinations proved that leukemia was not the cause of the pathological changes.

The case does not exactly correspond to those described by Osler under the head of splenic anemia, since his cases

presented the following features: (*a*) Chronicity, (*b*) splenic enlargement, (*c*) jaundice and ascites, (*d*) anemia, (*e*) hematemesis, (*f*) enlargement of the liver; but in none was there enlargement of the superficial lymph nodes, and none presented myxedematous signs.

In the case which I am presenting, chronicity is doubtful, since the patient first noticed the enlargement of the spleen only a few months before she came under my observation. It is true that her physical condition had been below par for a year or two. But preceding the attack of pneumonia, which was four months before she discovered the splenic enlargement, she had not considered herself in any sense a sick woman. Anemia, hematemesis, jaundice, liver enlargement, all terminal symptoms, might have arisen later, had the disease been permitted to continue.

The most marked unusual features of the case under consideration are the general enlargement of the superficial lymph nodes, and the myxedematous symptoms, thickened puffy skin and mental hebetude, with complete disappearance of all symptoms and pathological conditions in other tissues, after the removal of the spleen.

I desire to acknowledge valuable assistance, in the study of this case, from Dr. C. E. Brush, Associate Professor of Practice of Medicine in the Medical Department of the University of Nashville.

DISCUSSION.

Dr. W. P. Carr, of Washington, D. C.—Two years ago, at a meeting of the Society held in Baltimore, I reported five cases of splenectomy, and two of them were very similar to Dr. McGannon's case; that is, they were cases in which the spleen was enlarged without any apparent cause. There was no history of malaria, of syphilis, or of tuberculosis, and in these two cases the blood was not very much altered. Both of them recovered and are in good health today. One of them was a woman who had a spleen which weighed

eight or nine pounds, and she came into the hospital recently with a broken arm, but in perfect health otherwise. One of my cases was a malarial spleen, and the patient was not very much improved after the operation, although there was some temporary benefit. He had a great deal of gastro-intestinal trouble, and died two or three months later from it. The other two cases were traumatic, and these made good recoveries. But one thing that has impressed itself upon me is that every case of enlarged spleen is a diseased one, and is secreting an altered secretion. There is no doubt, I think, that the spleen, like the thyroid gland, has an internal secretion which becomes altered when the glands become hypertrophied and diseased, and that it leads to general disturbance. The thing that I noticed more particularly in my cases was a persistent diarrhea. Three of them with enlarged spleen had diarrhea which could not be controlled even by large doses of opium and a strong astringent with it, but this diarrhea ceased almost immediately when their spleens were removed. In the one case with gastro-intestinal trouble, with malarial spleen, the diarrhea returned, but was never so severe as at first, and was easily controlled. The other two cases were entirely relieved of it. I am fully convinced that we ought to regard an enlarged spleen just as we do an enlarged thyroid gland, as a cause of disease; and, except in cases of leukemia, where operation almost invariably turns out fatally, these spleens ought to be removed.

Dr. J. Shelton Horsley, of Richmond, Va.—The case reported by Dr. McGannon is interesting both from a surgical and pathological standpoint, and I would like to ask if he could exclude sarcoma of the spleen. Sarcoma of the spleen is rather difficult to diagnosticate, that is, round-celled sarcoma, so far as the pathological features are concerned, as compared with sarcoma of other organs. As a matter of fact, there is hardly anything that is sufficiently typical under the microscope to permit differentiation in every case between the various enlargements of the spleen. In splenic anemia there is no method by which we can examine a section, without the clinical history, and say this condition of the spleen comes from splenic anemia. Banti's disease begins primarily in the spleen, and if the spleen is removed soon after, the case is permanently cured, but if allowed to

go until the toxins cause trouble with the spleen and reach the liver, and cause cirrhosis of the liver, removal of the spleen will hardly do any good.

A little over a year ago I operated on a case of Banti's disease in the early stage. The history was typical. The patient was a comparatively young girl, with enlarged spleen, who had had several severe gastric hemorrhages, and one or two hemorrhages from the bowel, passing tarry, partially digested blood. The blood examination was typical. As we all know, sometimes we will find but little actual anemia here. The hemoglobin may be quite high, and the red blood cells as high as 4,000,000. But there is a leukopenia, sometimes marked. In this case there were only 3600 white cells. The patient made a satisfactory recovery, and has improved steadily since operation.

Dr. George A. Hendon, of Louisville, Kentucky.—I want to report a case in this connection which occurred in a woman of about forty years of age. She was the wife of a farmer, who applied to me about four years ago concerning a lump in her left side. Operation was advised, but refused. She returned after a year, when an operation was done for the removal of the spleen, which weighed four and one-half pounds. According to the report of the microscopist, it was a sarcoma of the spleen. I have not the exact data at hand; I cannot give you observations on the blood, because I would have to trust to memory. But since the operation the patient has gone on for three years apparently in a perfectly normal condition. She goes about her work on the farm the same as she did before. At the time I took great pains to make an extensive search of the literature and found that of sarcoma of the spleen in the last fifty-five years, since 1850, there have been only 3700 or 3800 published reports of cases in which this tumor involved the spleen primarily. That was up to three years ago, when I made the operation. I have not kept up with the reports of cases since that time. My case in its clinical history was strikingly similar to the one presented by Dr. McGannon.

Dr. McGannon (closing).—Primary malignancy of the spleen is one of the rarest conditions. Many of the cases reported some years ago were considered as having been due to malignant disease, but a careful study of them has demonstrated the fact that sarcoma or cancer of the spleen

is a very rare condition. Due consideration was given to this idea in the study of this particular case, and we were able to exclude it absolutely.

The operative technique in connection with splenectomy is of small importance, but the fact that these cases are surgical is of great importance to this Association, and to every man who is doing surgical work, and to every person who suffers from this particular trouble.

The physiology of the spleen at the present time is not very well known, and in this particular case reported the prominent points upon which I wish to lay special stress are early enlargement of the lymphatic nodes and the myxomatous symptoms. We are not accustomed to find in a diseased condition of the spleen or such symptoms as result when there is an absence of proper activity on the part of the thyroid gland, and yet that seems to have been the case in this particular instance. I believe the thyroid itself played no part in the production of the mental condition and puffiness about the skin seen in my case.

The whole subject is to a large extent still unsettled, so that every case of this kind that comes under the observation of any member of the medical profession is one worthy of thorough consideration, and not only of thorough consideration and careful study, but the case should be reported accurately and in all its details.

FIBROIDS AND PREGNANCY.

By Charles L. Bonifield, M.D.,
Cincinnati, Ohio.

Fibroid tumors of the uterus are said to be the penalty a woman pays for celibacy. All observers agree that they are much oftener seen in women, who have not borne children, than in those who have, and, we can safely say, that sterility predisposes to fibroids and fibroids predispose to sterility. Fibroid tumors have a tendency to render women sterile in three ways: (1) The hypertrophic endometritis they produce, renders the endometrium unfit to receive and nourish the ovum. The nearer the fibroid is to the endometrium, the more marked its effect on this membrane. (2) They are frequently complicated by and apparently cause disease of the appendages, which prevents conception. (3) They may so displace the cervix, that it is not bathed in seminal fluid during the sexual act, but as a fibroid may exist without producing any of these conditions, and as pregnancy may occur in spite of the presence of one or more of them, the co-existence of fibroid tumors and pregnancy is by no means extremely rare. It is probably more frequent now than formerly, for women are marrying later in life and thus putting off their childbearing, until they have reached the age, when fibroids are prone to develop.

Effects of Pregnancy on Fibroids. Pregnancy by the physiological hyperemia of the uterus, to which it gives rise, usually causes fibroids to grow rapidly. During the process of involution, following the normal termination of preg-

nancy, fibroids may decrease in size very perceptibly. Cases have been reported where they have disappeared entirely. I cannot recall a case coming under my observation, where the shrinkage after pregnancy, has been commensurate with the growth during pregnancy. Decrease in the size of fibroids after pregnancy is neither sufficiently constant, nor sufficiently marked to justify one in recommending pregnancy as a therapeutic measure to a woman, who has a fibroid.

Effects of Fibroids on Pregnancy. Fibroid tumors may have little or no effect on pregnancy, or labor, or may give rise to the most serious complications. Submucous fibroids may cause the premature expulsion of the ovum. This is especially apt to occur, if the ovum is implanted immediately over the fibroid, for in such a case "the seed has not fallen on good ground."

The danger of infection after abortion is great in these cases, the low vitality of the fibroid renders it unable to resist invading germs and the uterine contractions may so interfere with its blood supply, as to cause it to slough. The following case was of this character:

The patient was the wife of a physician in Southern Indiana. She had been pregnant and miscarried at about the fourth month. A large submucous fibroid which she had became infected. When I saw her, her temperature was 105°, and her pulse 140. I did not think she would survive a hysterectomy. The tumor was, therefore, removed by morcellement, but the patient succumbed in a few minutes after being returned to bed.

Pregnancy may go to term and labor may be normal, but followed by severe hemorrhage, the fibroid acting as a foreign body in the uterus and preventing normal contraction and retraction of the muscular fibers. The efforts of the uterus to expel the fibroid may be successful as in the following case:

The patient was seen in the summer of 1886, with Dr. G., of Norwood. I was asked to see the case forty-eight hours

after delivery, because the doctor believed he had an inversion of the uterus to deal with. I agreed with his diagnosis and made an effort at reposition, which being unsuccessful, an anesthetic was given. I then recognized that it was a fibroid polypus, which had been expelled from the uterus and vagina. The pedicle was about the size of an index finger and was attached a short distance above the internal os. I rotated the tumor to twist the pedicle and then severed it with a pair of scissors. There was no hemorrhage and the patient made a prompt recovery. There is danger in such a case, if the fibroid be attached near the fundus, that inversion may follow the expulsion. If a fibroid of the uterus has developed between the folds of the broad ligament, it may prevent the uterus rising into the abdomen, as pregnancy advances and give rise to symptoms so severe, as to demand immediate surgical relief. A case of this kind was the following:

Mrs. R. was brought to my office by her family physician, Dr. Loomis, of Independence, Kentucky, who told me that he believed she was pregnant and that she had a large tumor. Upon examination I found a large tumor, filling the pelvis and extending above the umbilicus. The patient's left leg was swollen to twice the size of the right. I was unable to reach the cervix and could form no opinion as to the probability of pregnancy. Dr. Loomis and the patient both said the tumor had almost doubled itself in size in four weeks. She entered the Good Samaritan Hospital on February 8, and on February 10, I did a supravaginal hysterectomy. She was three and one-half or four months pregnant. The tumor had developed in the left broad ligament and far down behind the uterus and vagina. In lifting it out of the pelvis, a large hole was torn in the rectum. This was repaired with chromicized catgut. The iliac vessels were uncovered for considerable distance, but fortunately were not torn. The abdomen was closed without drainage. The recovery was uneventful.

A fibroid tumor springing from the lower part of the uterus

may so fill the pelvis as to prevent the passage of the child, either prematurely or at term. I have had two such cases.

Mrs. J. entered Christ's Hospital on May 13, 1900, on the obstetrical service under the care of Dr. L. S. Colter. She was five months pregnant and was having severe labor pains, but the head was unable to engage, and Dr. Colter seeing that delivery could not be effected, asked me to see the case. We decided at once on surgical intervention and I opened the abdomen and did a hysterectomy. The patient left the hospital well, June 14.

Case II.—On the night of October 25, 1902, I was summoned to see Mrs. T. D., in consultation with Drs. Richards and Schoolfield. I reached the bedside about 2 A.M., and found the patient had been in labor six or eight hours. She was thirty-two years of age, the mother of two children, the youngest of which was fourteen months old. She had been delivered of this child in New York, and while the labor was tedious, lasting twenty-six hours on account of an early rupture of the membranes, the use of instruments was not necessary and the physician in attendance made no mention of anything abnormal to the patient or her family.

When Dr. Richards was called at the beginning of labor, he found a large fibroid filling the hollow of the sacrum and obstructing the pelvic inlet to such an extent that he believed delivery per vias naturales to be impossible. He asked Dr. Schoolfield to see her in consultation, who verified the diagnosis and expressed the same opinion as to the possibility of delivery. I was asked to see the case for the purpose of doing a Cesarean section, if my opinion coincided with theirs. We placed the patient under an anesthetic to make a more careful examination and ascertain, if it were possible, to lift the tumor up out of the pelvis. We found this could not be done and advised her immediate removal to the hospital for operation. The operation was performed at 7 A.M., about twelve hours after the onset of labor. The labor pains had been strong and the os was well dilated, but the head had not even begun to

engage in the pelvis. A Cesarean section was done in the usual way and a well-developed female child was delivered which still lives to bear the expressive if not euphonious name of "Cesaria." The tumor was attached very low down on the posterior wall of the uterus. Its removal would apparently demand a panhysterectomy and I thought this would add much to the gravity of the operation. I, therefore, deemed it wise to wait and see what effect involution might have on the tumor, hoping a myomectomy might then be possible. The patient reëntered the hospital and a panhysterectomy was done June 7, 1903. The fibroid had grown rapidly since the last operation and had so filled the pelvis that she was unable to empty her bladder. After the abdomen was opened it was lifted out of the pelvis with difficulty. Gauze drainage brought through the vagina through a hole made for the purpose at the bottom of the cavity, left by the tumor, was used to control oozing. The recovery was prompt.

Subperitoneal or interstitial fibroids that are interfering with pregnancy or promise to interfere seriously with delivery may be removed by myomectomy. Numerous cases have been reported where the operation has been successfully done, without the interruption of pregnancy. Only one such case has come under my observation.

I assisted Dr. E. W. Mitchell, to operate on this case, June 12, 1889. The patient was a mulatto woman, pregnant for the first time. Pregnancy had advanced to the fourth month. A fibroid tumor attached low down to the posterior wall of the uterus was pretty well filling the pelvis and causing a great deal of discomfort. All efforts to push the tumors up out of the pelvis were futile. The abdomen was, therefore, opened. The tumor was found attached by a comparatively small pedicle. The pedicle was ligated and the tumor removed without difficulty. Recovery from the operation was uneventful. Dr. Mitchell induced labor at seven and one-half months for pelvic deformity and the child was stillborn. The patient has not again conceived.

Myomectomy. Myomectomy should usually be limited to those cases in which the tumors are not numerous and are easily accessible. In spite of the reported successes of myomectomy, one cannot expect the uterus to withstand too much traumatism without rebelling. The part of the uterus from which the tumor springs, is important. The fundus or the upper part of the body and near the median line, are the most favorable locations. Near the tubes or the cervix, the hemorrhage is more troublesome, necesitating more manipulation. In fleshy women, with a very thick abdominal wall, it is especially difficult to enucleate fibroids down near the cervix with the dexterity that is necessary to success. Long deep incisions into the uterine walls, must weaken them and render rupture at the time of labor possible, if not probable. Most, if not all, of the cases of myomectomy reported during pregnancy have been done during the first five months. Certainly the cases in which it would be justifiable after that time, are rare. After the uterus has risen well in the pelvis, the tumor is not apt to produce unbearable symptoms, and, it is often surprising how nature is able to place it during the later months of pregnancy, so that it will not interfere with labor. Bearing this fact in mind and knowing that if she fails to accomplish this feat, he can come to her help, and with a Cesarean section or Porro operation, save child as well as mother, the surgeon can well afford to await developments.

Fibroids Cause of Extra-uterine Pregnancy. Fibroid tumors may be the cause of extra-uterine pregnancy. Dr. Gillette, of Toledo, exhibited at the last meeting of the American Association of Obstetricians and Gynecologists, a beautiful specimen of extra-uterine pregnancy, removed about two months after missed labor, in which a small fibroid occluded the uterine end of the tube and was the evident cause of the condition. Noble mentions 6 cases of ectopic pregnancy complicating fibroids in a series of 2274 cases.

In some cases, it is evident, from the beginning of pregnancy that it will be impossible for it to proceed, until the

child is viable. Under these circumstances the life of the child must be disregarded. Such a case was the following:

Miss L. was referred to me last May, on account of a very large multinodular fibroid that filled the pelvis and extended above the umbilicus. I advised immediate operation, but did not see her again till September, when she reported for operation, but told me she had missed two menstrual periods and admitted there was a possibility of pregnancy. The cervix was pushed up so high behind the pelvic arch that it could not be palpated, and I could not form a satisfactory opinion as to the existence of pregnancy. She entered the Good Samaritan Hospital, September 7, and I did a supravaginal hysterectomy. After the operation the uterus was opened and a three months' pregnancy found.

The number of cases which should properly be treated in this way, is small. I believe surgeons inexperienced in abdominal surgery and obstetrics are either prone to overlook pregnancy as a complication of fibroid or overestimate the importance of fibroids near the fundus as a complication of pregnancy, for in recent years I have seen more than one specimen of pregnant uterus which has been removed on account of presence of fibroid where the proper treatment would have been delivery at term and a myomectomy some months later. In the following case I first attempted myomectomy but on account of technical difficulties abandoned it for hysterectomy.

I saw Mrs. S. in consultation with Dr. Carlton, of Latonia. She was just recovering from an attack of gallstone colic, of which she had been an occasional victim for several years. She was thirty-five years of age, mother of three children. I advised her to enter the Good Samaritan Hospital for surgical treatment. The day before her operation she asked me to make a pelvic examination as she had recently had a great deal of discomfort in that region. I readily discovered two or three fibroid nodules near the cervix, but on account of her being one of the fleshiest women I have ever treated, I was

unable to diagnose a three months' pregnancy, which existed. She exacted a promise from me that I would do all the surgery I found indicated when the abdomen was opened. After removing a large number of gallstones and establishing drainage for the gall-bladder, I closed the gall-bladder incision and made another to deal with the pelvic condition.

I at once recognized a pregnant uterus with a number of fibroids near the cervix, one of which was between the folds of the broad ligament. The location of the tumors and the great thickness of the abdominal wall rendered their enucleation exceedingly difficult and I soon saw that it would unduly prolong the operation to persist in my efforts, and I did a supravaginal hysterectomy instead. The convalescence of the patient was prolonged by some infection in the fat of the lower incision, but she made a good recovery. I should have displayed better judgment, had I left the uterus undisturbed until the end of pregnancy and delivered her by Cesarean section.

The cases reported are all that have come under my care in which fibroid tumors have made surgery necessary during pregnancy. The cases I have seen in which surgery was not required are much more numerous.

DISCUSSION

Dr. R. S. Hill, of Montgomery, Ala.—Fibroids are said to be very much more frequent in the negress than the white woman and those of us who are familiar with the negro race know that copulation and child-bearing begin early in life; I, therefore, can not endorse the suggestion by Dr. Bonifield that these growths are more frequent now than formerly, because women marry later in life. In other words, I do not believe sterility is a cause of fibroids, though I am convinced they cause sterility. It is said that 30 per cent. of women with uterine fibroids are sterile. In my opinion these growths are more frequently found now, not because they are more frequent, but, because our examinations are

more thorough and, therefore, our diagnoses are more accurate. The reason these tumors do not more frequently complicate pregnancy in such a way as to call for surgical interference is found in their location. Ninety per cent. of them have their origin in the fundus and posterior wall of the organ, leaving only 10 per cent. for the anterior wall and cervical region. As a general thing a fibroid growing from any part of the uterus covered by peritoneum will be lifted out of the pelvic cavity as pregnancy advances, unless there has been some inflammation to cause adhesions to the pelvic wall. Those tumors making exceptions to this rule will be found so wedged in the pelvic cavity as to produce symptoms independent of pregnancy that will call for interference. And should pregnancy take place, which I think improbable, there will be an early abortion. The tumors that are prone to cause obstruction at confinement are those growing from the lower end of the uterus not covered by peritoneum, and as this is seldom the location of fibroids we do not often meet with this complication. Mr. Bland Sutton gives simple degeneration of fibroids as a cause of surgical interference during pregnancy. I am inclined to think he exaggerates the importance of this change by making interference the rule rather than the exception. I have had one case in which sarcomatous degeneration necessitated the complete removal of a four months' pregnant uterus. In brief I may say the diagnosis was made by an exploratory incision called for on account of severe suffering of several weeks' duration.

Dr. Rufus B. Hall, of Cincinnati, Ohio.—This is a very interesting subject and one that interests the physician when he comes face to face with pregnancy complicated with a fibroid tumor. The most important question that comes up to be settled is the one, Can the patient be delivered in the presence of this tumor? My experience has been that these patients seek relief on account of recent aggravation of their symptoms, after they have known they have had a fibroid tumor for several years.

These cases should be divided into two groups: (1) Those patients who have a fibroid tumor developing in the upper segment of the uterus complicated with pregnancy. (2) Those patients in whom the tumor is situated in the lower segment of the uterus. As to the first group, as a rule, the operation can be deferred. The second group, as a rule,

calls for interference on account of the obstruction to the delivery, and to relieve the patient's sufferings, which demand relief. A number of these patients, like the cases reported by the essayist, cannot be delivered in the natural way, and not only that, in a number of them suffering is so great that pregnancy must be ignored and the patient given relief by surgical intervention at once. In some of them the symptoms are not so urgent, and the question of allowing pregnancy to go on, and the tumor remain until the child is viable, comes up, and whether a Cesarean section should be done, as in one instance, by Dr. Bonifield, is to be discussed by the physician. I have had experience in two cases recently, that emphasizes what I said about the second group, in which we are forced to operate. In one instance I was asked to go to a neighboring city in the night; she had been in labor forty-eight hours or more, and it was her first pregnancy. She was about forty years of age. She had been conscious of the presence of a fibroid tumor for five or six years. When I saw her there was a foul-smelling discharge escaping from the vagina, and the patient was in an extreme condition. She was having her labor pains every two or three minutes; we hurriedly prepared her for operation. I did a Porro operation; she was about seven months pregnant. The child had been dead several days, but the patient made a nice recovery.

Dr. Frank D. Smythe, of Memphis, Tenn.—I reside in a locality where we have a great many negroes, hence I see a great many fibroid tumors of the uterus.

It is not my custom to interfere with a case of pregnancy associated with fibroid unless the fibroid is large enough to justify interference independent of the pregnancy, and then not until the child is viable, if avoidable, so that the operation may be performed with the hope of extracting a living child. In that event I do not hesitate to say, as I said on the former occasion, with reference to the Porro operation, where operation is to be performed for symptoms directly referable to the tumor, it is preferable for the reason that after the operation of myomectomy we find the patients return to the surgeon, or some other surgeon, for subsequent removal of fibroid tumors of the uterus.

At a meeting of the Mississippi Valley Medical Association last year, I delivered the Address on Surgery, at Columbus,

in which I took occasion to say that were I called upon to give an opinion as to the propable cause or causes of fibroid tumors of the uterus, I would say that they are predisposed to by two factors that are commonly present in the negro race, in which race fibroid tumors so largely predominate. They are practically syphilized and it is a notorious fact that they are addicted to the practice of excessive venery. These two factors without entering into a discussing of the reason for this, are powerful factors in the production of fibroids.

I have operated upon several cases of fibroid tumors in the past year or two upon whom I had previously operated for fibroids, doing the operation of myomectomy. Four of these patients have returned to me for operation, having fibroid tumors removed that have grown since the operation of myomectomy was performed. One patient only has been delivered of a child upon whom I have previously operated for fibroid tumor of the uterus.

Dr. Guy Le Roy Hunner, of Baltimore, Md.—I have been particularly interested in this question of the existence of fibroid tumors of the uterus and their treatment, from the standpoint of myomectomy *versus* hysteromyomectomy. I think the last speaker (Dr. Smythe) has had a rather unusual experience in the large number of cases he has had return to him for subsequent operation. No doubt we have all had one or more cases return after we have done many myomectomies, but in spite of that, I think that myomectomy is one of the most satisfactory operations we have in gynecology, from the standpoint of conservatism and from the point of view of future pregnancies. I do not think there has been enough emphasis laid in the literature, or in our meetings, on the danger of myomectomy *versus* hysteromyomectomy. I happened to be working with Dr. Kelly during the early days when he was first doing myomectomy, and I saw some very ill patients after the operation. Apparently, the conditions of bad pulse, high temperature, and pain were due to a collection of blood in the raw spaces left by the myomectomy. Early in this work I was led always to dilate the cervix as a preliminary to the abdominal operation, and if the mucous membrane is exposed during the myomectomy, it is my practice to cut out a little window of mucous membrane, if this is not already taken

out with the tumor, and push a little iodoform gauze down through the previously dilated cervix, to act as an aid in the escape of blood. I think it is a distinctly more dangerous operation, and this ought to be emphasized at all times; yet, in spite of that, I consider it one of the most satisfactory operations we have in gynecology.

Dr. R. C. Coffey, of Portland, Oregon.—I would like to report briefly one case which has a general bearing on this subject.

Last July I was called to Walla Walla by Dr. Suttner, to assist him in doing a transfusion for a patient who had been confined ten days previously. The Doctor had discovered a fibroid tumor which he thought was possibly interstitial or submucous during the development of pregnancy. She had considerable hemorrhage at the time of delivery, and, in fact, was almost exsanguinated. As the patient rallied, she began to bleed again. He then attempted to clean out the uterus. It did no good. He packed the uterus, removed the packing later, and hemorrhage recurred. Each time hemorrhage took place the patient became very weak. The blood would cease, to start again as soon as the patient rallied. In this particular instance we did a transfusion. The blood did not seem to have the power of coagulation, and so we did a transfusion successfully by Crile's method. We took the blood from the husband, who was a large plethoric man, the blood of the patient did not coagulate as we incised her arm to isolate the vein, but when we completed the operation of transfusion, the blood coagulated easily, and to our great surprise, even though the vessels were full afterward, no hemorrhage occurred from the uterus.

I do not know whether this particular case has a general bearing or whether it was merely a coincidence.

ELEPHANTIASIS OF THE MALE GENITALIA.

WITH REPORT OF CASES.

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The following cases, owing to their interest and the comparative rarity of the affection in this country, have furnished the stimulus for the preparation of this paper.

Case I.—Allen P., colored, male, aged fifty-two years. Has lived in the South all of his life, and has never been out of the United States. Mother living, age about seventy; father dead, cause and age not known.

The previous history of this patient, as well as could be elicited, is as follows: At the age of twenty-one had an attack of jaundice, which lasted some eight days; at various periods of his life had attacks of malarial fever, but none of them of a severe or prolonged type. Denies all history of syphilis, but had gonorrhea at the age of twenty-one. There is no history of stricture. When about the age of twenty-two he received a blow on the left side of the head near the anterior inferior angle of the parietal bone, inflicted by a hoe, producing a depressed fracture of the skull at this point with a resulting paralysis of the right forearm and wrist.

The present trouble began, to the best of his recollection, about six years ago, as a small growth about the size of a buckshot located at the penoscrotal juncture and to the right of the midline of the body. At first this was hard and painless, but rapidly grew, in about three weeks' time to a mass the size

of a hen's egg; becoming soft, the patient himself opened it with a pocket knife, and evacuated about a half pint of greenish watery fluid; or, to borrow his own expression, it looked like "Paris-green water." This incision closed at once and the mass continued to slowly increase in size until it became, in some three years' time, as large as a cocoanut. At this time, the patient sought relief from a physician in his neighborhood, who made free and lengthy incisions on both sides into the mass and attempted to drain it. Following the operation, the patient first began to have fistulous openings, through which the urine has dribbled since. This precedure gave no relief, and the enlargement steadily and slowly advanced until it reached the size shown in the accompanying photograph. The tumor now is an enormous affair, reaching almost to the patient's knees, very hard, and in places nodular, not unlike that of a fibroid tumor, except, at the under surface near the perineum, where the feel is soft and blubbery; the penis is lost in a mass of dense, fibrous tissue, and during the act of urination, the urine escapes not only from the meatus, but also from three or four fistulous openings at various points on the surface of the growth; mixed with the urine is considerable pus. The inguinal glands are somewhat enlarged, though freely movable under the skin. No hernia can be demonstrated. Patient was admitted to St. Margaret's Hospital, September 16, 1908; physical examination of lungs negative; heart is considerably enlarged and irregular, though no murmur is demonstrable; liver and spleen normal; both legs are edematous, the right much more so than the left. The blood is negative for the malarial plasmodium; and examinations made on two successive nights in an attempt to find the filaria sanguinis hominis are likewise negative. The urine, owing to the large amount of pus from the fistulous tracts, was not examined prior to operation; an examination of the urine after removal of the mass, shows the following:

Reaction, acid; color, yellowish straw; specific gravity, 1020; albumin, none; sugar, none; uric acid, small amount;

red blood cells, none; pus corpuscles, none; tube casts, none; no granular fatty matter, no oil globules, no filariæ sanguinis hominis.

Operation on morning of September 18. Some half-hour before operation, the patient was placed on operating table and the tumor elevated as high as possible in order to drain back into the general circulation some of the fluid from the edematous part of the scrotum.

Under ether narcosis, incisions were made on either side, over the superficial abdominal rings and prolonged downward to the penis; an effort was made to dissect out the penis from the dense cartilaginous mass surrounding it; this was found to be impracticable as the fistulous tracts leading from the urethra had produced much scar tissue. It was then decided to make a clean amputation of both penis and scrotum, including the testes, as it appeared to be a useless procedure to preserve the latter when the penis had to be sacrificed. At this stage of the operation, after the vessels of the cord, and the cord itself, had been ligated on either side, a Wyeth's pin, as ordinarily used in hip-joint amputations, was made to pierce the under surface of the mass very close to the perineum. A stout rubber tube was now passed around the tumor as near the body as was possible and firm compression made. With a long amputating knife, the growth was rapidly removed without the loss of an ounce of blood. Vessels of visible size were next ligated and the tourniquet removed. All loose edematous tissue was excised and the flaps trimmed back to healthy skin. The urethral orifice was next identified and sutured to the skin margins; the remainder of the wound was so approximated as to form, when sutured, an irregular Y, the urethra emerging near the juncture of the vertical and horizontal arms.

The patient reacted nicely from the anesthesia and his recovery was rapid and uneventful. (Fig. 2 shows the final operative result.) He left the hospital in two weeks, and since that time has been, apparently, as well as he ever was. Several

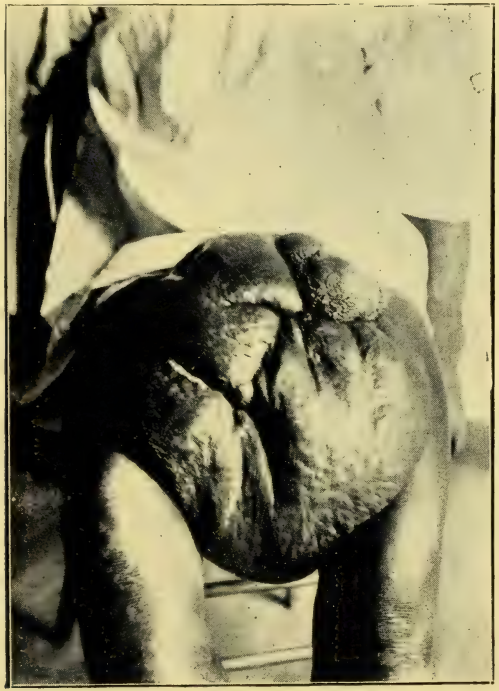

Fig. 1.—Elephantiasis of male genitalia.

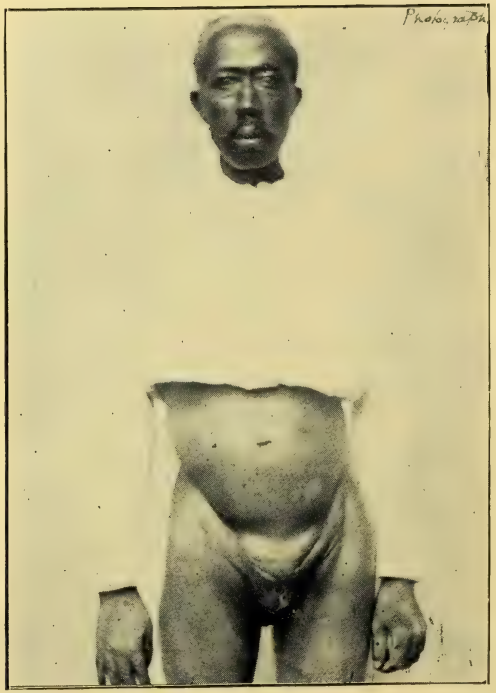

Fig. 2.—Elephantiasis of genitalia (after operation)

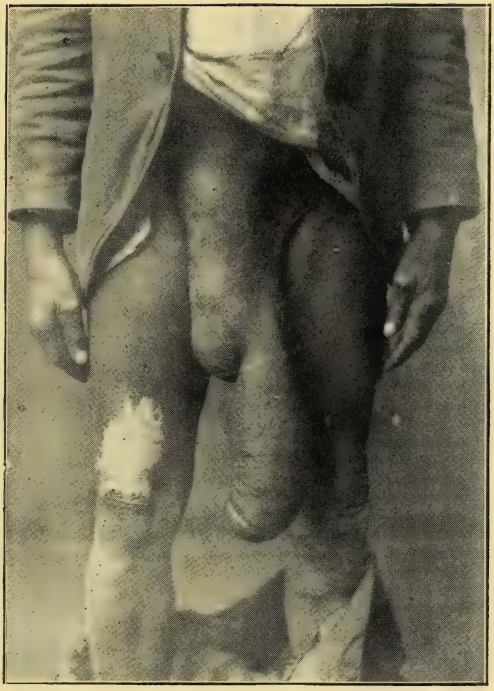

Fig. 3.—Elephantiasis of genitalia.

blood examinations made since the operation have failed to reveal evidences of the filaria.

The pathological report of a section of the growth, taken from the denser portion, together with the blood examination, made by Dr. E. M. Mason, are as follows:

Marked hyperplasia of connective tissue; edema; dilatation of lymphatics with, here and there, evidences of new formations of lymph vessels; small scattered areas of round-cell infiltration.

Examination of the blood shows: Red blood cells, 2,992,000; white blood cells, 5000; hemoglobin (Sahli), 40 per cent. Differential count: Polymorphonuclear leukocytes, 54 per cent.; small mononuclears, 36 per cent.; large mononuclears, 3 per cent.; transitional, 25 per cent.; eosinophiles, 2.5 per cent.; mastzellen, 2 per cent. No nucleated red cells; no filariæ.

Fresh blood: Considerable variation in size and shape of cells. Individual cells pale. Numerous microcytes and a few poikilocytes. No parasites. No nucleated reds.

Case II.—A. G., colored, aged about eighty years. Has lived in Alabama practically all of his life and has never been out of the United States.

Owing to his present feeble mental condition, his past history is most unsatisfactory and untrustworthy, but he dates the beginning of his trouble (elephantiasis of the penis, Fig. 3) to an injury received from a falling tree some thirty years ago. At this time, considerable injury was done to the external genital organs and right leg. (The figure shows an extensive scar above the knee.) There are also cicatrices in the left inguinal region, the result of indiscretions in his more youthful years. This obstruction in the lymphatic glands has also contributed no small part, I fancy, to the causation of the present condition, by a retardation of the return flow of lymph. There is a pronounced hernia on the right side which is a frequent complication of both penile and scrotal elephan-

tiasis. The enlargement in this case is purely cutaneous and subcutaneous, involving, not at all, the corpus spongiosum, corpora cavernosa or scrotal tissues; the glans penis can be outlined underneath, about three inches below the symphysis pubis.

No blood examinations have been made in this case, as repeated efforts to get this old man to the hospital have failed. Nor has relief come to him through surgical means, as he prefers to bear his present ills than fly to others he knows not of.

The interesting features presented by these cases, lie, not in any surgical difficulties encountered, but rather in the possible etiological factors concerned.

The question whether elephantiasis is not a specific disease, depending upon a specific cause—for instance, a true parasite—has been freely and ably discussed by various authors, notably Lewis, Manson, Bancroft, Carter, and others. In the endemic variety, such a connection has been fairly well established, and it appears that its existence is associated with the filaria sanguinis hominis, about which more will be said later.

In considering the etiology of the sporadic variety, we may gain a fairly clear comprehension of the disease; one which includes all the pathological factors, producing lymphangitis and all kinds of atypical forms of inflammation, especially erysipelas. The question arises whether these attacks of inflammation—repeated at various and irregular intervals, constitute a true erysipelas, or a lymphatic process peculiar to elephantiasis alone. The consensus of opinion is, that the streptococcus discovered in several cases, corresponds to a specific cause different from that which produces genuine erysipelas.

However, a true erysipelatous condition may precede elephantiasis, if the local conditions are favorable; in fact, it may be caused by any decided inflammation or induration of the soft parts, such as chronic eczema, syphilis, ulcers, strictures and fistulæ. Not infrequently it has been known to

follow the radical removal of suppurating lymph nodes. It is difficult to ascertain the specific cause of many of the cases of elephantiasis that occur sporadically in our climate, for the affection is apparently occasioned by various factors, favoring the theory of a recurrent inflammation and obstruction of a lymphatic, edematous character. If the disease begins in a dependent portion of the body as, for instance, the scrotum, penis, vulva, or leg, any local process or factor calculated to impede the venous circulation might give rise to elephantiasis.

For the cases now under consideration, in view of the negative blood findings (in the first case) as regards the filaria sanguinis hominis, the inability (in the first case) to locate the filaria Bancrofti in the removed tumor, the prolonged neglect and improper handling of the earlier manifestations of the trouble, be the primary infective agent what it may, it would seem that the resulting cicatrices, coupled with the continuous and prolonged inflammatory processes, would suffice to bring about such a stasis in the lymph and venous flow as to eventuate, finally, in just such a condition as presented. As a matter of fact, it is rather surprising when we consider the number of obliterating inflammatory processes which assail the inguinal glands and lymphatics; the number of neglected cases of urethral and peri-urethral abscesses with extensive sinuses and fistulous tracts, that more cases of elephantiasis and lymph scrota are not encountered.

So much for the causative agents which may conspire, either singly or one or more in conjunction, to produce the sporadic form of elephantiasis. Tropical elephantiasis is now known to be caused by the partial or complete occlusion of some lymphatic vessel or gland by the filaria sanguinis hominis or its embryos. For the solution of the many intricacies of this problem, as well as for the working out of many of the isolated facts which are now welded together to form a complete chain, we are indebted to the restless and indefatigable labors of Patrick Manson. The credit of the discovery of the specific parasite is usually wrongly ascribed

to Wucherer, who, in Bahia, Brazil, in August, 1866, found embryos in the urine of a case of tropical chyluria. In 1868, Salisbury, in the United States, found the ova in the urine. Lewis, in India, in 1872, discovered embryos in the blood of man, and noted that their presence was generally associated with chyluria and lymph scrotum, and he it was who proposed the name filaria sanguinis hominis. Manson has pointed out that the filaria sanguinis hominis of Lewis, the embryonic form of the filaria Bancrofti, a mature parasite, which has for its habitat the lymphatics of man, is not the only blood worm in man, but that there are at least three or four others. Lewis' filaria, however, is the only one possessing important pathological significance, and for it Manson suggested, on account of its nocturnal excursions into the peripheral circulation, the name *filaria nocturna*. The geographical distribution of the filaria nocturna is very extensive throughout tropical and subtropical countries. It occurs in a large part of China and India, Japan, Australia, and the South Sea Islands. In Samoa, for example, it has been estimated that fully one-half of the population show filariæ in the blood. Guiteras, in 1886, called attention to the existence of this disease in the Southern States; he found four cases in Key West and one case in Charleston, S. C. De Saussure, 1890, published a report of 22 cases he had observed in Charleston; this city had been in constant communication with the West Indies, and doubtless, the disease was introduced into this country from those islands.

In 1888, Mastin, of Mobile, reported an indigenous case occurring in that city.

Slaughter, of Alexandria, Va., in 1891, reported two cases of filaria sanguinis hominis occurring in his practice.

Henry, in 1896, and Dunn, in 1898, report, each, a case of filaria sanguinis hominis.

Lothrop and Pratt, of Boston, in 1900, report two cases of filaria sanguinis hominis occurring in two brothers. These, however, were not indigenous, as both of their patients were

born and had lived, prior to their coming to America, for many years on the island of Barbadoes.

From the available literature at my command, I have been able to collect only thirty indigenous cases of filaria sanguinis hominis occurring in the United States.

The embryonic form, that is, the *filaria nocturna*, when examined in fresh blood, is seen to be a minute, transparent, colorless, snake-like organism, which, at first, shows active movements. After a time, however, the movement slows down, and one can see that the little worm is shaped like a snake (Manson). On measurement, it is found to be about $\frac{1}{80}$ of an inch in length by $\frac{1}{3000}$ of an inch in diameter—about the diameter of a red blood corpuscle. With the high power of the microscope there can also be demonstrated a sheath which is considerably longer than the worm it encloses.

A singular feature in the life of the embryo is what is termed the "filarial periodicity."

If under ordinary conditions of health and habit, the blood be examined during the day, the parasite is rarely seen. It will be found, however, as evening approaches, that the filariæ begin to enter the peripheral circulation in increasing numbers. Manson estimates that from forty to fifty million are simultaneously circulating in the bloodvessels. After midnight the number begins to gradually decrease, and by eight or nine o'clock in the morning, they have practically disappeared from the peripheral circulation. As Mackenzie has pointed out, reverse the habits of a filarial patient and the periodicity is reversed. For this periodicity no reasonable explanation has, as yet, been given, but it is manifest that the periodicity is an adaptation of the habits of the parasite to the nocturnal habits of the mosquito. During the temporary absence from the cutaneous circulation, Manson demonstrated that the filariæ retired principally to the larger arteries of the lungs.

The mosquito—the female belonging to the genus Culex—and also, according to James, Anopheles, has, through a chain of very beautiful studies, been shown to be the intermediate

host for the filaria sanguinis hominis. After going through certain metamorphoses within the stomach and thoracic muscles of the mosquito, requiring some sixteen to twenty days, it would seem that they migrate to the proboscis, and there patiently bide their time until the host next feeds on a warm-blooded vertebrate animal—usually man. Here, as in the case of the malarial parasite, it is most probable that this is the only mode of entrance. Yet, however, introduced into the human body, the filaria finds its way into the lymphatics. Arrived in one of these, it obtains sexual maturity, fecundation is effected, and in due course, new generations of embryo filariæ are poured into the lymph. (Manson.)

Parental Forms. (*Filaria Bancrofti.*) These have been found many times. They are long, hair-like, transparent nematodes, three or four inches in length. The sexes live together, often inextricably coiled together and tightly packed in the more distal lymphatics; sometimes they inhabit the large lymphatic trunks, and not infrequently the thoracic duct. The female is the larger, both as regards thickness and length. The two uterine tubes, occupying the greater extent of the body, are filled with ova at various stages of development. The oral end of both sexes is tapered, club-shaped, and simple; the tail is also tapered and abruptly rounded off.

As a rule, cases of filariasis are not pathogenic; that is, the fully-formed parasites circulate innocuously and indefinitely in the blood, and the guest and host may dwell together for years in harmonious association; *the parent worm and the immature products of conception, alone, are dangerous.* What, then, marks the transition from a state of innocuousness to one of pathogenic significance? In some instances, a single worm, or a bunch of worms, may plug the thoracic duct or a large lymphatic, and thus act as an embolus; or, the worm may give rise to an inflammatory thickening of the vessel wall and so lead to obstructions from the consequent stenosis and thrombosis; in the same way minor lymphatic trunks may become occluded. As a result, the lymhpatic areas

drained are cut off from the general circulation and varicosities and edema follow. Manson holds strongly to the view that one of the chief factors in the production of lymph stasis is the blocking of the smaller lymph channels by the ova, which, for various reasons, may be prematurely discharged from the parent filaria. However, lymph stasis alone is not sufficient to produce elephantiasis. There must be added inflammation, which is most often caused by trauma, with a resulting lymphangitis. Given these two factors, lymph stasis and repeated localized inflammation and elephantiasis supervenes.

Pathology. Irrespective of the causative agent in any individual case, the resulting pathological changes are invariably the same.

The peculiar characteristics are a chronic inflammation, cell proliferation and hypertrophy, which involve, in a varying degree, all the structures of the affected parts. Implication of the connective tissue constitutes the most prominent feature of the disease, and produces the bulk of the mass.

The various layers of the skin become so matted by reason of the enormous increase in the fasciculi of the fibrous tissue, that they can hardly be distinguished. The corium becomes enormously thickened and indurated. Upon section, the parts show the hypertrophic tissue to be fibrous, sclerotic, and homogeneous. In some cases, dilated lymph pockets appear, from which lymph or chyle escapes, resulting from the obstruction of one or more large lymph trunks. The part pits but slightly or not at all on pressure, and does not glide over the underlying tissues. There also may be much thickening, obliteration, and dilatation of the veins.

It is a noteworthy fact that when elephantiasis develops in a case of filariasis, the filariæ sanguinis hominis are usually not to be found in the circulation; this fact is explained by the location of the parent worm in the distal lymphatic and the subsequent blocking of the more proximal channels by the ova and products of inflammation, together with the possibility of the death of the parent worm.

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DISCUSSION.

Dr. William H. Doughty, of Augusta, Georgia.—I only want to say a word or two on the technique of the operation in such cases. Some fifteen or more years ago I operated on a case of this kind, the tumor being very nearly as large as the largest in the photographs shown. The penis was completely buried in the mass, and there were also some fistulous tracts; I do not remember exactly the number or their location. The mass was removed with great ease. I simply bisected it very much as one would bisect a fibroid uterus, splitting it down in the median line,

practically without hemorrhage, taking the two masses off, one on each side, after dissecting down through the non-vascular solid tissues until the vessels were exposed lying near to the skin. The testicles and cord were dissected out of the mass as well as the penis. One of the interesting features of the case was the fact that there was a phosphatic stone about as large as an almond in the urethra at about the perineoscrotal junction. An attempt was made to cover in the penis and the testicles, by flaps taken from the abdomen, but that was only partially successful, as more or less sloughing took place. The final result, however, was satisfactory to the patient. Within the last year, he reported that his condition was very satisfactory. The operation was done fifteen years ago.

REPORT OF AN ACCIDENT TO AN INFANT SEVENTEEN MONTHS OLD, WITH EXTENSIVE INJURY TO THE ABDOMINAL WALL AND EVISCERATION OF ALL OF THE SMALL INTESTINES, WITH RECOVERY.

By Rufus B. Hall, M.D.,
Cincinnati, Ohio.

The subject of this report John D., infant, aged sixteen months and three weeks. The only child of working people, living in a three-room flat.

On Saturday, September 12, 1908, the mother had devoted the day to canning pears. She had worked diligently and hard, and had about completed her task at 5.30 P.M. The baby, which could walk, had been permitted to eat freely of the ripe fruit, and he had availed himself of the opportunity. He had also had the freedom of the room, distributing the peelings promiscuously over the floor in his effort to amuse himself. He was a strong, well-developed, vigorous child.

At the hour mentioned he had become peevish and tired out, and the mother had decided to give him his evening bath and put him to bed, so she could prepare the evening meal for her husband by the time he was expected home from his work. She stripped the child entirely naked, holding him on her lap, gave him a good warm bath, using plenty of soap in doing so. To facilitate the rinsing off of the soap, she stood the child on the drain board of the kitchen sink and turned water over him. The child could not talk, but he

could understand what was said to him, and laughed and enjoyed the process of his novel bath very much. After the mother had rinsed the soap off, she told the child to stand still until she went across the room for a towel. As soon as she left him, he fell or jumped off from the sink, which is about two feet and a half high. In falling, he struck the right side of his abdomen on the top of an empty half-gallon glass Mason fruit jar. The impact broke the jar, telescoping it, leaving four sharp prongs remaining on the bottom of the jar. These sharp points did great damage to the patient. The child gave one scream and fainted from the injury. When the mother picked him up the intestines were protruding from the wound. She carried him into the adjoining room, on into the front room, calling for help. She was quickly joined by some of her neighbors, and, as the intestines were protruding greatly from the wound and the child bleeding freely, they advised the mother to lay him on the bed, which she did, and over the protruding intestines they laid a towel, and immediately called their family physician, Dr. McKibben, who lived but two squares distant. He arrived on the scene in a few minutes. He at once recognized the gravity of the injury, and applied, over the towel, towels wrung out of warm water and sent a message to telephone for me. I arrived at the home of the child about thirty minutes after the accident. The room was crowded full of sympathizing friends and neighbors. The child was semiconscious, pulseless, cold extremities, rapid and superficial breathing. It was bleeding from the large wound in the abdomen. I at once placed a couple of hemostat forceps at the inner angle of the wound, which controlled the bleeding. The child had lost much blood. Knowing somewhat of the nature of the accident, I had taken with me an emergency grip and the head nurse of my hospital. We at once made an operating room of the kitchen, using the kitchen table for the operating table, and under the one small gas jet, which was all the room afforded, we hurriedly prepared for our

work. Within ten minutes after we entered the house the child was on the operating table. There was an abundance of hot water on the stove. All of the small intestines, the pyloric end of the stomach, and about four inches of the ascending colon were outside of the abdomen. There were sticking to the coils of bowel and omentum several pieces of peelings of the pears and one piece of tomato peeling, probably picked up from the floor, which was well littered with them at the time.

With the assistance of Dr. J. T. McKibben giving the anesthetic and Miss Hatfield, the nurse, assisting me, we proceeded to repair the injuries. Using an ordinary hand pitcher, the intestine and omentum were irrigated several times by turning warm water over them. There was bleeding from the ragged rent in the omentum. This was ligated. I commenced at the pylorus, passing the small intestine carefully through my fingers as I replaced it through the large rent in the abdominal wall. I looked carefully for injured points to the intestine, expecting to repair them as I came to them. I had reduced about half of the small intestine when I came to a large rent, an inch and a quarter long, in the mesentery. Fortunately it did not sever a vessel of any great size. This rent was closed with the running suture of catgut. I proceeded rapidly with replacing the intestine, all the while looking for more peelings of the fruit, but none were found until we had nearly completed the replacement of the small intestine, when quite a large piece of peeling was found sticking to the mesentery. There were several scratches on the surface of the small intestines through the peritoneal covering, but not of sufficient depth to require suture. The head of the colon was the last part of bowel replaced. A remarkable condition was present: the small intestines throughout were so full, they felt like ordinary sausages.

The wound in the side of the abdomen, shown very plainly in the photographs here presented, which I will describe later, was closed with through-and-through silkworm-gut

suture, and my attention was given to the wound over the tenth rib, which I found had cut across the rib and was bleeding from the intercostal artery. This was ligated and the wound closed with suture. There was a ragged-shaped wound one inch in front of this going through the abdominal wall. The ragged wound, about an inch behind the large wound in the abdomen, did not enter the abdominal cavity. You will observe the large wound commenced at the anterior superior spine of the ilium on the right side. It extends a little forward and upward for two inches, then downward and forward for an inch and three-quarters, making a V-shape wound. The latter half of this wound, while it is only an inch and three-quarters on the skin surface, dipped forward in the muscles for fully an inch, making a broader wound on the inside than on the outside.

The wound cut across the deep epigastric artery, and it was from this vessel that the child lost so much blood, and this is the vessel that was clamped with a hemostat when I first reached the child's bedside. The operation and the dressing did not consume more than fifteen minutes' time. When the child was placed in bed the breathing was more regular and fuller, but there was no sign of a radial pulse, and the shock was profound. I had little hope at the time that the child would rally from the shock, owing to the great loss of blood, but after a few hours, by the usual remedies, warmth returned to the extremities and a feeble and very rapid pulse could be felt at the wrist. He had a restless night, and we were compelled to use an anodyne to quiet him. At 10 P.M. the rectum temperature had reached 99°. It rapidly rose, and at 12 M. (midnight), the temperature was 103° and the abdomen was distended with gas. Knowing that the child had eaten freely of the fruit during the day, it was ordered $\frac{1}{20}$ of a grain of calomel every half hour with a teaspoonful of water. An enema was given, which emptied the lower bowel. The temperature rapidly rose, and at 6 A.M. the temperature per rectum was 106.5°, with general twitching of

the muscles throughout the body. The child was delirious. The abdomen was enormously distended with gas. An ice-cap had been ordered at 12 M. (midnight). Cold sponge baths were ordered, which reduced the temperature in thirty minutes to 103°, but it rapidly rose again within an hour and a half to 106.6°. The general condition of the patient grew worse until 12 M. (noon) Sunday, at which time we succeeded by an enema in getting a good stool with a great quantity of undigested pears. Within an hour or so the child passed about a pint and a half of undigested pears. At the same time he passed great quantities of gas and the abdominal distention entirely disappeared. Within two hours the temperature dropped to 100°, and all the symptoms were greatly improved and the outlook seemed very much more favorable. The delirium disappeared as soon as the temperature dropped, and it did not return. Afterward there was no unusual distention of the abdomen with gas. The child was fed and nursed carefully for two weeks. Part of the stitches were removed on the tenth day and the remaining stitches were removed on the twelfth day. The wound united throughout without a drop of pus.

Sunday evening, twenty-four hours after the accident, the child commenced to cough, which soon developed into a bronchitis. This cough annoyed him more than anything else after that time. The cough caused much pain in the abdomen, and we were compelled to give codea to control the cough. His temperature ranged from 99° to 101° for one week, at which time the cough entirely subsided and the temperature dropped to normal, and for the next week fluctuated from normal to 99.5°. At the end of three weeks the child was permitted to be taken out for an airing. After that time he improved rapidly and has grown steadily, as a normal child should.

The photograph, which I present, was made on December 3. The mother says the child has gained several pounds in flesh and has not been sick a minute since he recovered

Dr. Hall's case.

from the accident. I report the case because the accident is one of such an unusual character, accompanied with a great loss of blood in such a small infant. The rapid recovery is another demonstration of the fact that it does not matter much where the surgery is performed if you can have cleanliness in and about the wound.

One could hardly imagine a more unfavorable condition for antiseptic surgery than pertained in this instance, yet the outcome was satisfactory. The fact that the intestinal tract was so full of undigested fruit complicated the recovery very markedly. It was this fact that made us anxious to get the intestinal tract emptied as soon as possible after the accident.

The case illustrates in a marked degree the great benefit to be derived by thoroughly emptying the intestinal canal. For several hours on Sunday forenoon before the intestinal tract was cleared the condition of the patient was in extremis. Within an hour after the first movement was obtained the picture was entirely changed, and within two hours after the first movement convalescence was established. The child at this writing is perfectly well, growing nicely, and has remained so since he recovered from the operation.

DISCUSSION.

Dr. John D. S. Davis, of Birmingham, Alabama.—This paper is interesting and illustrates two points: First, the resources of nature; and second, that good surgery can be done anywhere. I remember in the early surgical work of Dr. Price, he operated on patients in the alleys of Philadelphia when there would not be such a thing as a sheet in some instances to cover the table. That was the experience of my brother and myself; we had no hospital facilities for the care of these cases, and surgery was followed in such cases by remarkably good results.

I want to report a case to illustrate the resources of nature, and what an undergraduate can do. A negro woman was cut with a knife, making a zigzag incision from the ensiform cartilage down to the ilium on the left side, as a consequence

of which the intestines protruded. She was brought in an ambulance to the hospital with the intestines held in her dress to keep them from falling out upon the stretcher. The members of the hospital staff were away at the time. One of my students, who had had very little experience except in laboratory work, when he had assisted me in my experimental work on dogs, feeling I would not get there early enough, obtained consent of the superintendent to do the best he could for the woman.

He washed off the intestines, sutured three incisions into them, put them back into the abdominal cavity, closed the zigzag incision with tier sutures, and the woman got well without much elevation of temperature. I do not think the temperature went over 99.5. Those two points are clearly illustrated by this paper.

TEMPORARY VENTROSUSPENSION OF THE UTERUS: ITS TECHNIQUE, INDICATIONS, AND END RESULTS.

By Edward H. Ochsner, M.D.,
Chicago, Illinois.

Permanent ventrofixation of the uterus was in great favor with gynecologists between the years 1886 and 1896, when Noble[1] was the first to point out several of its most serious dangers. Now I believe its employment in child-bearing women is rarely recommended; the only notable exception to this, which we were able to find, is in a recent article by Olshausen,[2] who still favors its employment.

After ventrofixation came into disfavor, permanent ventrosuspension became popular, but even this operation, while it still finds a champion in Polak,[3] is nevertheless proven to be not entirely without danger, and in the recent articles of Peterson[4] and Cragin[5] three cases are reported in which its employment subsequently necessitated Cesarean section. So strongly are these two writers opposed to this operation that they condemn it most emphatically. The exact words of Peterson are: "The fact that one never can say definitely that a woman will be free from serious dystocia should she

[1] Transactions of the American Gynecological Society, 1896, p. 247.

[2] Folia Therapeutica, January, 1908, vol. ii, No. 1, p. 14.

[3] Surgery, Gynecology, and Obstetrics, July, 1908, vol. vii, No. 1, pp. 29 to 33.

[4] Physiology and Surgery, December, 1907, vol. xxix, No. 12.

[5] Surgery, Gynecology, and Obstetrics, July, 1908, vol. vii, No. 1, pp. 45 to 47.

become pregnant after ventrofixation or ventrosuspension is enough to condemn the operation in the eyes of the conscientious surgeon."

The objections to permanent ventrofixation and suspension have repeatedly been enumerated in the literature. The reasons which have appealed most to me personally, and because of which I have never done either in a child-bearing woman are: first, that they may interfere seriously with subsequent pregnancies and labors; second, that they offer a very considerable chance for subsequent intestinal obstruction; third, because in recent years more effective and less objectionable methods have been devised; and finally, because I have always had an aversion to permanently fixing normally movable intra-abdominal organs.

The well-merited disfavor with which permanent ventrosuspension and fixation are now regarded should not prejudice us a priori against a temporary suspension which has all of the advantages and none of the objections of the former. For many years abdominal surgeons have been looking for some method which would prevent adhesions between the uterus and the pelvic floor after the evacuation of large pelvic abscesses and infected tubes. This idea is well expressed by Olshausen[1] who says: "The fixation in a proper position of the freed and replaced uterus should, however, be a feature of the operation, as otherwise it may be assumed with tolerable certainty that the retroflexion will recur, and that the more or less wounded posterior surface of the uterus will again acquire attachment." So far as I have been able to ascertain, none of the operations previously employed have been entirely satisfactory. Thus, for instance, Graves[2] reports the end-results in five hundred cases of retroversion of the uterus treated by various operative procedures. He found 9 per cent. recurrences in 267 cases of ventrosuspension and fixation, 13 per cent. recurrences in 191 cases of

[1] Folia Therapeutica, January, 1908, vol. ii, No. 1, pp. 8 to 15.

[2] Boston Medical and Surgical Journal, 1907, vol. clvii, pp. 1 to 8.

Alexander's operation, and 31 per cent. recurrences in 35 cases of internal round-ligament shortening.

About twelve years ago the discussion was at its height as to whether it would not be better to adopt the routine procedure of removing all of the internal sexual organs, including the uterus, when operating for these extensive pelvic abscesses, and this operation has recently again been advised in the writings of Kelly,[1] Bovée,[2] and Metcalf,[3] and within the past year by Boldt,[4] in spite of the fact that it has numerous serious objections. Boldt, in the Febuary 1, 1908, issue of the *Journal of the American Medical Association* says: "If it is necessary to sacrifice both ovaries, then the uterus should be extirpated." I think you will agree with me that if the same or better results can be obtained without sacrificing this organ, we should not extirpate it in these cases, because it certainly will increase the shock to these already devitalized patients; it opens up extensive fresh areas for infection and absorption; it favors weakening of the pelvic floor, for if the infection is still active we cannot be sure that the round ligaments will become firmly united to the stump of the uterus, even if they are carefully fastened to it; and finally, the operation is objectionable because it is contrary to our modern tendency to conserve this organ whenever possible.

Knowing these objections, numerous operators have devised various methods of intra-abdominal shortening of the round ligaments, and have paid much attention to carefully covering over the raw surface with peritoneum whenever this was possible, also placing the sigmoid behind the uterus and the omentum over everything. Emerson[5] uses perma-

[1] Operative Gynecology, 1906, vol. ii.

[2] American Journal of Obstetrics, New York, 1906, vol. liii, pp. 165 to 175.

[3] Journal of American Medical Association, December 7, 1907, vol. ii, pp. 1898 to 1904.

[4] Journal of American Medical Association, February 1, 1908, vol. l, No. 5, p. 334.

[5] Journal of Surgery, Gynecology, and Obstetrics, N. Y., 1906, vol. xxvii, pp. 507 to 515.

nent ventrosuspension as a routine measure in cases in which the ovaries and tubes have been mutilated, even if no previous displacement has existed, and he argues that after the tubes and ovaries have been removed, the uterus, if left behind, is very apt to fall back into the pelvis, where it becomes firmly fixed. Boldt, in the article above referred to, goes even further and says if both ovaries are not removed "not infrequently a ventrofixation of the uterus may become a desirable adjunct to other surgical treatment."

However, as none of these operations and precautions, except the last one, seem to be successful in a sufficiently large percentage of cases, judging from the number of cases I see annually, who have previously had abdominal work for pelvic infection, and in whom the uterus is retroverted and firmly adherent to the sacrum, acting as a plug to the pelvic outlet, I believe we are justified in concluding that either the methods above cited are not generally enough employed or efficiently performed, or that even when properly used are not able to accomplish what they are intended for in a sufficiently large percentage of cases.

In order to prevent these undesirable after-effects I have devised a method which I have used with great satisfaction for about seven years, and while the method may not be original, Dr. Hench and myself, in looking up the matter rather carefully, have not been able to find it described anywhere.

It occurred to me years ago that if one could secure a temporary ventrosuspension of the uterus in practically every case of extensive pelvic infection in which a radical operation is performed, the problem would be solved, and it was with this end in view that the operation which will subsequently be described was devised. I think we will all agree that if this can be accomplished in practically every instance, it is much to be preferred to a hysterectomy or to permanent ventrofixation or suspension.

Broadly speaking, I believe the operation is indicated in

every laparotomy for pelvic trouble in the female in which there is subsequent danger from retroflexion and adhesion of the uterus and in which the Gilliam operation or some one of its recent modifications is not applicable.

I am informed that Gilliam himself strongly advises against using his operation if infection is present at the time of operation, because there is too much danger of causing extensive infection of the abdominal wall, and I believe most surgeons who have adopted the Gilliam operation or one of its modifications have heeded this advice.

To specify the indications a little more clearly I would say that it is specially applicable in cases with large pelvic abscesses, where large denuded areas are bound to remain after the evacuation of the abscess and removal of the infected organs, and also in cases of pyosalpinx, ovarian abscesses, old extra-uterine pregnancies, and appendiceal abscesses with leakage into the pelvis, in which the uterus shows a marked tendency to drop back into the pelvis when all the intra-abdominal work is completed.

The technique of the operation is as follows: In laparotomies where it seems probable that this temporary ventro-suspension will be desirable, the laparotomy incision is made so that at the lower angle the skin incision is distinctly the longest, then the fascia and muscle, and finally the peritoneal wound, being the shortest. After the intra-abdominal work is completed a needle armed with a double strand of ten-day catgut is introduced through the left rectus fascia about half an inch below the lower angle of the fascial incision, then through the left rectus muscle, and finally through the peritoneum about an inch below the lower angle of the peritoneal incision. It is now passed through the uterus about an inch behind the apex of the uterus, taking a good bite and being careful not to abrade the peritoneal covering of the uterus. The needle is now passed out of the right side in reverse order to its introduction on the left, and the stitch is tied just tight enough to bring the uterus in contact with the inner

surface of the peritoneum, but not tightly enough to cause destruction of the peritoneum from pressure. The sigmoid is now carefully placed behind the uterus and the omentum spread over this, covering all of the raw surfaces which it may have been impossible to cover with peritoneum. The wound is now closed in the ordinary manner.

The most important point in the operation is to get the unabraded uterus in contact with the unabraded parietal peritoneum, there then being only two needle punctures in each where the continuity of the peritoneum on one side and the peritoneal covering of the uterus on the other is interrupted.

We are beginning to learn that permanent intra-abdominal adhesions occur only when two raw surfaces come in contact. By protecting the omentum carefully during the operation, and thus preventing abrasions of its endothelium, and by bringing the uterus forward as just described, it is possible to complete the peritoneal toilet in such a manner that no two structures which have lost their endothelial covering will be left in contact. While healthy endothelium will glue itself fast to abraded surfaces temporarily, it will prevent the connective tissue cells of one structure from intermingling with the connective tissue cells of the other structures, and of course this is the only way of getting permanent adhesions. We have also learned that temporary adhesions between the various intra-abdominal organs, if not too extensive, are not at all serious, and that the least objectionable of these are adhesions between the omentum and sigmoid or between either of these and any of the other organs.

If the operation is performed as above described there is no danger of permanent ventral fixation or suspension, while, on the other hand, the uterus will be held forward until the abraded areas have had an opportunity to heal over or to be covered by such structures as the sigmoid and the omentum. If the omentum has not been injured it will soon free itself again, and if a few permanent adhesions should form between

the sigmoid and the uterus they are not likely to cause serious trouble. Furthermore, this temporary ventral suspension will give the round ligaments an opportunity to contract and regain their tone, and when the time comes they will be capable of performing their duty in giving the uterus its proper support, especially as the uterus will now be free and will soon regain its normal weight.

I have repeatedly made the observation that in cases in which the uterus has been strongly retroflexed and firmly fixed to the posterior pelvic wall the round ligaments have become markedly atrophic, mere strings, so to speak, while in cases where the uterus is held backward by a band of some length, allowing some motion, the round ligaments are often greatly hypertrophied. In other words, if the uterus is so firmly adherent that contraction of the muscle fibers of the round ligaments is absolutely futile, the fibers will soon atrophy and stop contracting, but if by contracting they are able to approximate the two ends of the round ligament, they soon regain their tone. Thus in the three cases in which I did a second operation I found that the round ligaments had regained their normal size and tone and were again performing their duties satisfactorily.

During the years 1906 and 1907 I performed thirty-two laparotomies in which this operation seemed indicated. In all, the uterus dropped back into the abraded pelvis after the intra-abdominal work was completed. For convenience, I have classified them under eight headings, according to the most prominent pathological finding. Practically all, however, exhibited several pathological lesions, any one of which would have required surgical interference. Thus, for instance, several had pelvic abscesses and at the same time appendicitis. I placed each one of these under only one heading, chosing that heading in which the lesion was most pronounced.

Thus, there were 10 cases of salpingitis, 9 pyosalpinx, 4 ovarian abscess, 3 multiple pelvic abscess, 2 appendiceal abscess, 2 simple appendicitis with pelvic adhesions, 1

multiple fibromyomata necessitating myomectomies, and 1 double multilocular ovarian cyst.

I will not give any of these histories further than to say that, of these 32, 2 subsequently returned for secondary operations. Each one of the 30 has been examined three or more times since the operation, and in every case the uterus has been found movable, in good position, and none of them has been subsequently troubled with chronic constipation, a symptom which is so common following operations for pelvic infection, unless every precaution is taken to prevent adhesions, especially the adhesion of a retroflexed adherent uterus.

On three cases, two operated in the year 1906 and one operated in the year 1905, have I had occasion to do secondary operations and to examine the pelvic organs in each case about fifteen months after the first operation. One case, a large left ovarian abscess and left pyosalpinx, another a left cystic ovary and double salpingitis, and the third a pelvic abscess and right pyosalpinx and ovaritis and left salpingitis. These all being young women, I deemed it advisable to preserve the best ovary, which subsequently made trouble and had to be removed. In two of these patients the uterus was found perfectly movable, without adhesions, in normal position, with strong, well-developed round ligaments. In the third case the remaining ovary had become adherent to the sacrum, the uterus was slightly adherent to the sigmoid, was fairly movable, the round ligaments well developed and performing their duties. In none of these cases were there any adhesions either of the omentum or of the uterus to the anterior abdominal wall.

I have been doing this operation for about seven years, but as the first four years I was operating at several hospitals and have not a complete list of all the operations of this kind that I performed, I thought it advisable to confine my report to the cases operated during a definite period and cases which I have had an opportunity to watch carefully and examine repeatedly. I may, however, add that in no case which I

have had an opportunity to examine subsequently, have I found the uterus permanently suspended, or adherent posteriorly and acting as a plug to the pelvic outlet, a condition so often observed following operations for pelvic infection.

The operation above described has the following points to recommend it: It has none of the objections attributed to permanent ventrosuspension or fixation; it is extremely simple and consequently easy of application; it does not open up new areas for infection; it does not increase the shock of the operation; it leaves the pelvic organs in as nearly a normal condition as the pathological conditions for which the operation is undertaken permit; and finally it has the great advantage of apparently being practically always effective.

In conclusion, let me say, it would seem reasonable to suppose that many surgeons have made use of this procedure before, but as we were not able to find any record of it in the literature, we deemed it worth while to make this brief report.

DISCUSSION.

Dr. R. C. Coffey, of Portland, Oregon.—This is a very interesting subject, and Dr. Ochsner has described a very interesting operation. I think, however, it is quite essential that this suture (indicating), as I understand the doctor's operation, should be made quite loose. I fully agree with him as to the certainty with which the muscular round ligament will recover its normal strength and normal size if permitted to rest.

Recently I described an operation of plicating the folds of the broad ligament, taking a small bite of the round ligament, and in five cases I have had opportunity to see the results, and find in each one, as soon as the catgut was absorbed, the peritoneum was blended; the round ligament had freed itself under the connective tissue, notwithstanding it was doubled, and although it had become attenuated and weak, had become strong and was performing its normal duty, so that this is an important matter. We can state that the round ligament is not connected directly with the

broad ligament; it frees itself under almost any condition, no matter how you double it, and this we have demonstrated in every case we have seen afterward, five in all.

As to the necessity of abrasion for adhesions, I think I would modify Dr. Ochsner's statement to this effect: it will depend upon the amount of pressure made upon the peritoneum.

I have just concluded a second series of experiments on animals of suturing the layers of peritoneum to the abdominal wall, and called in my friend Dr. Mackenzie the other day to see the specimens, and he agreed with me as to the permanency of the fixation. The peritoneum, as in suturing the omentum to the abdominal wall in these dogs, has become blended, and there is a solid wall between the sutures as well as at the sutures, so that I can readily see that Dr. Ochsner's operation will be successful and the uterus free itself again. But great care should be exercised in making pressure, because if too much is used the peritoneal surfaces will become blended permanently and act in the same way as ventrosuspension.

Dr. John D. S. Davis, of Birmingham, Alabama.—I am glad Dr. Ochsner has described his operation before the Association, because I think it will help many of us. I have recently done this operation and can testify to its advantages.

There is no need for denudation to approximate two serous surfaces for adhesion, nor is a great deal of pressure required to get union. In the early experimental work upon intestinal surgery we all remember how Senn scarified the intestine before approximating the surfaces with his catgut plates. Later on I scraped the intestine, simply denuding the endothelium, and finally in my experimental work I found that was not necessary, nor was it necessary to approximate the surfaces tight (enough to get a pressure necrosis), but only a slight pressure was needed to get adhesion. I have not been as successful as Dr. Ochsner, for in attempting in one case in my early work to pull the uterus I brought it up against the abdominal wall too tight, and subsequent examination revealed the fact that the uterus was anchored. This demonstrates the fact that I did not follow the technique of Dr. Ochsner. This woman has never had children, and so I have allowed the uterus to remain anchored.

Dr. Henry T. Byford, of Chicago.—I have been very much instructed by the paper of Dr. Ochsner, but think the

recommendations of the operation have been a little too sweeping. We know that when the uterus has been attached mechanically to the peritoneum the adhesions have been known to draw out into a long band or ligament, and the uterus to become more or less retroverted, which would not have occurred if the round ligaments had developed enough to functionate normally. The ligaments stretched temporarily will be apt to regain their function, and a properly adjusted pessary may enable them to do so, the same as a suspension will. But they are often permanently lengthened and cannot be made short enough by anything but an operation upon the ligaments themselves. Since general surgeons have begun to devise methods for shortening these ligaments, every writer has tried to find a firmer way of anchoring them for fear they would not hold the uterus up. This method cuts the Gordion knot by letting the round ligaments alone, and thus proves that any old way will do in certain mild cases, while hardly any way will do in others.

Dr. Rufus B. Hall, of Cincinnati, Ohio.—This operation is a very important one, if all the Doctor claims for it turns out in future work to be true, but, it seems to me, it sets aside a lot of our best pathology and experience with reference to the formation of adhesions. We know that in cases of inflammation taking place in pelvic abscesses and all kinds of pelvic infection, the peritoneum, where it is inflamed, becomes adherent. The fact that Dr. Ochsner reports these cases, with his technique, and the uterus is in many instances movable, does not make it plain to me that all of them are minus adhesions. I have not tried the tehnique he has described, but I have in quite a few cases relied on a modification of Mann's operation of shortening the round ligaments and keeping the uterus forward in that way. I hope to be able to make use of the suggestion of the essayist.

Dr. O. H. Elbrecht, of St. Louis, Mo.—I have been much interested in this paper, and I shall try the method Dr. Ochsner has described. I believe, however, that in some of these cases there will be adhesions because it depends entirely upon the way the suture is drawn up, and, as Dr. Hall has brought out, inflamed surfaces will unite. In some of these cases there is inflammation of the peritoneum of the uterus, which will unite to the raw surfaces especially if there has been a chronic peritonitis. I believe this is a splendid

operation, for those cases in which we do not see fit to do the Gilliam operation, for the reasons already stated, in which we want to support the uterus sufficiently long to regain its tone. I do not believe the round ligaments will regain their tone in so short a time, if they have been indurated for a long time. We have all seen cases where the broad ligament, for instance, is as thick as one's finger, or thicker, and I do not believe for the short period of time the uterus is suspended by the catgut suture, that the broad and round ligaments will have sufficiently regained their tone to uphold that uterus. I believe the adhesive surface produced on the posterior wall, protracted by omentum, will be protected long enough to prevent the uterus from falling back. It is not going to be held forward; it will drop back, only it will be smoother at that time, and the probability is thus lessened. In all cases where there is not extensive inflammation, the operation apparently is a good one, because there are many cases in which we can suspend the uterus long enough to get the ligaments in better shape and where the Gilliam operation is objectionable. I believe Dr. Ochsner will find in some cases he will get adhesions to the parietal peritoneum, which will raise the same objection to the operation as has occurred against the older operations of ventrosuspension and ventrofixation. I do not believe any of us could operate on a series of these cases without getting adhesions to the fundus in a few where we may misjudge the tightness of our sutures, for where we bring peritoneal surfaces together fairly firm, we will get some adhesion. Temporary suspension of the uterus has its indications and place. We cannot do it in all any more than we can do the Gilliam operation or a ventrofixation. In cases of extensive pelvic abscess, where we have profound infiltration of the broad ligaments, we must do something like a fixation in order to hold the uterus firmly.

Dr. W. P. Carr, of Washington, D. C.—There is one point which I think ought to be made clear, and that is, if Dr. Ochsner's operation will hold the uterus up until raw surfaces have healed over, it does not make a particle of difference what has happened to the round ligament in the meantime. The round ligament can take care of itself afterward. If you can get the uterus up in its proper position and keep it there until the raw surfaces have healed,

it can drop back and flop around in any direction it wants to; it will not adhere after the raw surfaces are healed. Then the round ligament may have two or three years to regain its tone, and it will probably do it.

I want to endorse strongly the position Dr. Ochsner has taken in regard to the formation of adhesions. I think our teaching, experiments, and observations have shown the fact that we will never get adhesions, except, as he says, between two raw surfaces, or where there is some condition that will destroy the two surfaces that are brought in apposition. If there is not sufficient pressure to do that, if there is not infection to do it, if there are not two raw surfaces left, you will not get permanent adhesions; and it is clearly demonstrated that in all of these cases accumulations of lymph will disappear in a comparatively short time.

Dr. William M. Polk, of New York City.—I have listened with great interest to the capital paper Dr. Ochsner has presented on a subject that has for so many years been embarassing to those of us who do any kind of work in the peritoneal cavity. The position into which his operation lifts the uterus, has advantage over that in which the uterus is placed by the mere shortening of the round ligaments, for the reason, as anyone can see, it lifts it farther away from the point from which he wishes to avoid adhesions. But it occurs to me, that in very many cases we have a uterus whose posterior wall is not exactly free from tissue conditions which will forbid the formation of adhesions between that surface and coils of intestine, and while undoubtedly the sigmoid flexure, by being pushed down behind the uterus, will exercise a protecting influence against very much of that surface, since adhesions between the surface of the sigmoid and surrounding structures are of comparatively small consequence, yet if there should be a sufficient amount of this damaged surface left above the sigmoid flexure, as in my experience has been not infrequently the case where the uterus has been lifted too high, you have brought in contact with it the coils of small intestines, and of all the vexatious things that confront us, the adhesions which involve the coils of small intestine are most aggravating and most distressing, and most likely to give severe annoyance in the future, so that I have sometimes hesitated to adopt this procedure, not carried out exactly in the excellent manner

that Dr. Ochsner has suggested, but involving the same principle; for the reason which I have suggested. Perhaps I was somewhat overcautious in anticipating trouble where it would not occur. In this connection I want to give another operation the benefit of a doubt, which in my mind exists against the one which Dr. Ochsner has laid down, and that is the one alluded to by Dr. Byford. In fact, those of us who belong to the Rip Van Winkle type can go back twenty-two years when Dr. Byford's father took part in almost an identical discussion upon practically this same question, that is, how to treat the adherent uterus and appendages, and I remember very well then that there was a marked diversity of opinion, and while it is evident that great advance has been made, as is shown by the discussion here today, it is a refreshing assurance of the independence of medical thought to realize that there is still a difference of opinion. So far as the actual amount of good to be accomplished is concerned, I somehow feel, as may be presumed from what I have already said, that a simple temporary shortening of the round ligament (not invading the tissue of the round ligament itself, but rather its peritoneal sheath) by a loop or tuck, which you take, and attach by some one of the various methods which have been suggested, at the neighborhood of the internal ring; this will give us sufficient reposition to enable us to accomplish the purpose which Dr. Ochsner has in mind.

I do not feel that we can criticize in any way whatever the principle laid down by Dr. Ochsner, and if we venture to make any difference at all, it would be simply in the manner or method by which the purpose is to be carried out.

Dr. Ochsner (closing).—I wish to thank all those who have participated in this discussion, and especially the gentlemen who again emphasized the point that in stitching the uterus the sutures must not be tied too tightly, otherwise the peritoneum covering the uterus and the parietal peritoneum may necrose and then you will have permanent ventral fixation.

Dr. Hall.—Suppose there has been a very active inflammation, and the peritoneum is inflamed on the uterus, would you still fix the uterus with sutures?

Dr. Ochsner.—Yes. But I will say, as there is no royal road to Rome and as all roads may lead you astray, it might possibly happen that a permanent adhesion would result, but I believe this is very unlikely. If either surface is covered with healthy peritoneum, no adhesion will occur, otherwise, we could not do laparotomies in pus cases without having so many adhesions that all our efforts would be futile.

I took the precaution of not bringing this operation before this Association until I had employed it for over seven years and in about one hundred cases. While the number of cases is still small and consequently may not furnish conclusive proof, I believe they prove something. I have reported the results of my work by this method before this Association because it is composed of men whose judgment is worth much and because I should like to have you give this operation a trial. While I have used this method in about one hundred cases I have reported only thirty-two cases, because these were operated during a definite period and have subsequently been examined two or three times. In the other sixty odd cases, many of which I have subsequently examined, I have never seen chronic constipation with an adherent, retroflexed uterus, and so far as I have been able to determine, there has not been a single case of permanent ventrofixation or ventrosuspension.

My objections to plicating the round ligaments are twofold, the first practical, the second theoretical. Practically, I have seen too many recurrences after this operation; theoretically, it does not appeal to me, because it leaves the round ligaments in abnormal position and in their attempt to assume the normal they are almost sure to stretch again or to tear our the stitches.

Dr. William M. Polk, of New York City.—In reference to what Dr. Ochsner has said, unfortunately I cannot convince myself, in spite of authorities on pathology to the contrary, that a raw surface and a normal surface within the peritoneal cavity will not adhere. I have seen too many cases in subsequent opening of the abdominal cavity in which raw surfaces had become adherent to coils of intestine. For that reason, although I know it may be rank heresy to state it, it is worth while to look into this a little further before we commit ourselves to that dictum.

VESICO-UTERINE FISTULA AND LOSS OF THE FUNCTION OF THE VESICAL AND URETHRAL SPHINCTER MUSCLES. BOTH CONDITIONS SUCCESSFULLY OPERATED UPON.

By R. S. Hill, M.D.,
Montgomery, Alabama.

The case I wish to report was referred to me by Dr. Allen, of Fort Mitchel, Alabama.

Mrs. S., aged thirty-two years, 5 feet 6 inches high, and weighing 155 pounds, was delivered during the latter part of February, 1908, by nature's forces, after a tedious (eighteen hours) labor, of a lifeless though fully developed child. The presentation was normal. This was her second confinement. Eight years ago she was delivered of a living child after a shorter and much less severe labor. Within an hour after the birth of the child in February, she felt an intense desire to urinate and on being placed on the bed pan there was a tremendous gush of bloody water from the vagina. The urine from this time passed continually and involuntarily. Dr. Allen made the diagnosis of vesico-uterine fistula and brought her to me for operation April 1. On examination, I found all the urine coming through the cervix uteri. Ether was administered, the uterus curetted and separated from the bladder by a T-shaped incision in front of the cervix. The fistulous tract was found just below the peritoneal fold. The openings into the bladder and uterus were large enough to admit the end of my index finger. They were closed with buried catgut sutures. The incision through the vaginal mucosa was brought together with stitches of silkworm-gut. A medium-

sized soft rubber catheter was kept in the bladder ten days or two weeks. Urotropin and benzoate of soda, 5 gr. each, were given every four hours. The parts healed nicely, but when the treatment was discontinued and she was allowed to leave her bed it became evident, by the continuation of the urinary incontinence, that there was an absence of the function of the urethral and vesical sphincter muscles, which had not been previously detected. The question now arose as to whether this was caused by traumatism received during confinement or the retention of the catheter in the urethra. I felt quite certain that it was the former, not only because I do not believe a catheter can produce the condition at all when used as above indicated, but the relaxed and flabby state of the lower or vaginal wall of the urethra suggested a permanent injury, rather than a temporary relaxation of the muscular fibers. The reason, in my opinion, the condition was not detected before the operation to close the vesico-uterine fistula was done, is that the examinations were, naturally, made with the patient in the recumbent position, which with the large size of the fistulous openings, furnished such facility for the passage of the urine through the uterus that the bladder could not fill to overflow through the urethra. However, recognizing the fact that a foreign body placed in a natural or artificial tract tends to dilate it, she was advised to go home and wait a while, hoping the function of the restraining muscles would return. I felt sure it would if the catheter was responsible for the trouble, but, as previously said, I did not believe this to be the case. I am quite certain I would not have been so quick to advise delay had I known of an established operation for the restoration of the function of the muscles involved. She came back to me October 15 in the same condition as when she left, except a three months' pregnancy to complicate any operation undertaken for her relief. After searching in vain the literature at my command for what I considered a satisfactory operation, the following technique was adopted, which, so far as I am informed, has not hereto-

fore been used. With a medium-sized metal sound in the urethra as a guide, an incision was made in the middle line, through the vaginal mucosa, from the meatus urinarius to a point about one inch on the bladder wall. A second incision separated the vaginal mucosa from the meatus. The mucosa was now dissected from the underlying structures to the extent of one inch, transverse measurements, at the base of the bladder and one-half inch to each side of the urethra. The dissection exposed approximately two-thirds of the circumference of the muscular wall of the urethra. The sound in the urethra was now changed for one of smaller size. Commencing at the inner or bladder end of the denudation I folded in or brought together the muscular structures with a continuous catgut suture passed transversely, but never deep enough to involve the vesical or urethral mucosa. After each passage of the needle as the catgut was made taut, constricting the urethral channel, the sound was drawn from its grasp. The sound, therefore, served the double purpose of protecting the urethral mucosa from injury by the needle and indicating how much of the muscular tissue to include in the suture, in order to properly constrict the urethral channel. The flaps of vaginal mucosa, excepting their outer one-half inch, were now trimmed to make a snug covering over the underlying tissue and held in position with interrupted silkworm-gut sutures. Some of these sutures were made to include the deeper or muscular structures that had been brought together with catgut, thus reinforcing the latter. The tongue-like projections left at the outer end and to each side of the primary incision were crossed or overlapped and made to fit closely over the lower surface of the corresponding portion of the urethra—forming, as it were, a double collar around two-thirds of the circumference of its neck. The vaginal surface of the under or overlapped flap was made raw by a superficial dissection in order to get union between it and the opposed surface of the overlapping flap. The after-treatment consisted of the administration of urotropin and

benzoate of soda and catheterization with the smallest soft rubber catheter, every four or six hours. Though I thought there was danger of harm being done by the repeated catheterization, yet I considered it less likely to cause trouble than would the keeping of the instrument continuously in place. While the author does not believe, as he has previously said, that a catheter remaining ten days or two weeks or even longer in the normal urethra can impair the function of the sphincter muscles, at the same time, he can conceive, by its tendency to cause a dilatation of the channel, of its doing harm used in such a manner just after this operation. Right here I may say, I am not quite sure but that it is advisable after this or any similar operation, to establish a vesico-vaginal or even a suprapubic drain in order to leave the urethra and neck of the bladder absolutely quiet until firm union is secured. I am certain I would have made a vesico-vaginal opening had not my patient been pregnant. Such an opening would, in all probability, heal of its own accord. If it did not, it could, of course, be easily closed. My patient has not experienced the least trouble in retaining her urine from the day of her operation. She said to me: "I know I am well, as I had a sneezing spell and did not soil myself."

I agreed with her that this was the best test to which the parts could have been subjected. When the muscular wall from the neck of the bladder to the meatus urinarius is impaired, as was true in my case, it seems to me that there is no better way of correcting the evil than by bringing together, from side to side, as compactly as possible, its component parts. This, in the main, is what was undertaken by the operation I have given. Of course, the extent of the dissection, etc., must be regulated by the condition found in the individual case, and furthermore, if any one point of the muscular wall, as, for instance, either of the sphincter muscles, appears more injured than the rest, then special care should be exercised in bringing the ends of the muscular fibers together, even to the extent of using separate sutures of some absorbable material.

While a successful result in one case cannot entitle an operation to a place among the established surgical procedures, however, the simplicity of the technique I have given connected with the result in the case reported, encouraged me in the belief that we have in this, an operation that will stand the test of time and prove a useful means of rescuing many a woman from a miserable condition.

DISCUSSION.

Dr. Frank D. Smythe, of Memphis, Tenn.—I wish to congratulate Dr. Hill upon the recovery of his patient from a condition which might have rendered her life miserable had not this operation been performed. There might have been a spontaneous cure of the incontinence but that question cannot be discussed, since the patient was not subjected to a course of masterly inactivity.

As to the probable cause of the incontinence, I am satisfied from the description of the case that it was due to the separation of the muscular fibers surrounding the urethra, they being intimately attached to the anterior vaginal wall, which has some muscular fibers, some of the fibers being continuous from the uterus. The urethra is supported by the conjoined fibers of the lavator ani, to a considerable extent, which in a measure acts as it does when we have a median tear of the perineum, producing a patulous condition of the vaginal orifice.

I am convinced that the continuous use of the catheter could result in a passive dilatation of the urethra, and in such an event no operation would be required to effect a cure. I considered this case one of submucous separation of the muscular fibers and that the operation was timely. It was necessary to approximate the divided ends of the levator fibers, which contribute to the support of the urethra, in order to effect a cure.

Doctor Smythe is to be congratulated upon having resorted to a most ratinoal measure in the management of his interesting case.

Dr. Rufus B. Hall, of Cincinnati, Ohio.—I am glad that such an accident as Dr. Hill has reported is not common,

for the reason that in my experience it is difficult to correct. I think both the Doctor and patient are to be congratulated. I can recall cases in which I have not been so fortunate. One patient that came under my observation underwent two or three operations to correct incontinence. The patient had been operated on by another physician for urethral caruncle and the thermocautery was used, with the result that practically all of the urethra was destroyed, leaving a V-shaped opening into the bladder. I did not hear Dr. Hill's technique; but in my case I made a flap from either side and was able to build up a good urethra, which seemed apparently all right, but which was very poor for a urethra in that she had incontinence just the same. Two or three months later I split the new urethra, tried to get muscular tissue and make the urethra smaller, but with the same result. She had incontinence just the same. I did another operation. The woman wanted relief, otherwise she was apparently well. I dissected out the mucosa up to the neck of the bladder, and twisted it once around on itself, as you twist your coat sleeve around, and it was a beautiful result from a surgical standpoint, but still she has incontinence. That is Case I.

Case II was the wife of a doctor. She was over forty years of age when married. She had her first baby; was in labor several hours, with face presentation, and delivery was effected with forceps. She had great destruction of the pelvic floor and the bladder. I saw her several months after delivery. She is an invalid from her confinement. Since the birth of the baby she had a large vesicovaginal fistula, two inches long, and an inch broad, including not only the bladder, but the urethra. There was destruction of all the urethra except about one-quarter of an inch at the meatus. I repaired this and got union throughout. Surgically, the result was good, but she has incontinence. I tried to get muscular tissue to effect union, as scar tissue was very great. I was very glad when I obtained union throughout. She has refused to undergo a second operation. In looking at this patient from a surgical standpoint, the result is perfect, but she has incontinence.

THE SURGICAL TREATMENT OF EPILEPSY.

By W. P. Carr, M.D.,
Washington, D. C.

There seems to be no question at the present day that cases of traumatic epilepsy, or epilepsy due to any demonstrable localized lesion of the brain or skull, should come to operation as soon after the first seizure as possible; and that the sooner this is done, and the fewer seizures the patient has had, the better are his chances for cure.

Operation, however, in the so-called idiopathic or hereditary cases, and in all cases where the habit has become well established, is generally regarded as useless, and has been practically abandoned. My own experience, though limited, has led me to believe that we have been too hasty in abandoning surgery for the relief of this class of unfortunates, and that they have been given up on theoretical grounds rather than after a careful systematic trial of modern surgical measures.

Most surgeons have trephined a few cases, mostly traumatic, after the habit was well established, and have had only slight or temporary success.

I believe that very few of the so-called idiopathic cases have been operated upon since modern surgery has made the operation safe and easy; and yet sporadic cases have been reported from the earliest days of surgery, of cures following operations, not only on the skull or its contents, but operations for the relief of constant sources of irritation to peripheral nerves.

Cures of epilepsies and allied conditions are reported by

the older writers, who were as careful observers as any we have today, following injuries to the head, severe illness, tracheotomy, operation for phimosis, and even the removal of a piece of the gluteus maximus muscle. There have been too many such cases reported to be explained by mere coincidence. Many of these cases probably relapsed after a longer or shorter period; and some of them were unquestionably due to the mental impression, or suggestion, of the operation.

There are severe intermittent types of epilepsy that suddenly improve and remain well, or nearly well, for long periods, without apparent cause. Some of the cures may have been cases of this kind, that would have improved as much without interference. But they could not all have been of this kind. There are at least four factors to be considered in this connection: First, the removal of some cerebral condition; secondly, the removal of some peripheral irritant; thirdly, the powerful suggestion of an operation, especially of an operation upon the brain; and fourthly, the shock or illness following operation, which almost invariably arrests the habit for a time just as an attack of typhoid fever does. The cerebral condition removed may be depressed bone, thickened dura, a tumor, an abscess, serum that is producing pressure or simply waterlogging the brain, or toxic material of either autogenous or bacterial origin. I have reason to believe that one of my cases was due to an edematous encephalitis and meningitis caused by the germ of influenza, and that operation acted similarly to the opening of the abdomen in tuberculous peritonitis.

This has suggested to me a similar operation in tuberculous meningitis.

There seems to be no doubt that some cases of idiopathic epilepsy of long standing, and when the habit was well established, have been cured by operation, and that most of the favorable results have followed opening and draining the skull. I shall not go farther into the question of the modus

operandi at present, but I believe that if one epileptic in a hundred can be cured the operation is perfectly justifiable. Personally I have operated upon twenty epileptics during the past ten years, nearly all of long duration, with the habit well established, and most of them not traumatic, unless we consider every case traumatic that has a history of some remote blow on the head.

The results have been most encouraging. Nearly all were either cured or temporarily relieved to such an extent that they felt repaid for undergoing the operation. Eight have remained well to the present time, or were well when last heard from—one after nine years, one eight and one-half years, one seven and one-half years, one four years, one three and one-half years, one for one year, and two for three months.

These were all, except one, cases of long standing. Strange to say, I have had my poorest results in the cases I thought most favorable. There has been much discussion and difference of opinion among alienists as to when a case should be called cured. Some have said after one year of freedom from seizures, others five.

Three of my cases have been well for seven years or more. If we take three years, which seems a reasonable period, for an arbitrary cure, I have 5 cures out of 20 cases, or 25 per cent., and a probability of 3 more, or 40 per cent. Leaving out 4 recent cases operated upon less than two years ago, and 3 in which the result is unknown, I have 5 cures in 13 cases, or 39 per cent. I fully believe that this percentage is too high, and that a larger series of operations will show fewer cures, and I expect some of these cures to relapse even yet, but I feel that they have fully justified the 20 operations.

One case was almost imbecile before operation, and continued to grow worse afterward, finally landing in the insane asylum. The operation apparently hurried him along a little faster. This is the only one in which there was not at least a marked temporary improvement. Seven of those not cured

remained well for periods of from two to seventeen months. Most of these patients expressed themselves as not sorry they had undergone the operation, and two wished to be operated upon again.

The last case was referred by Dr. Henry K. Craig, who has written me an extremely interesting history of it. I quote from him as follows:

"J. H., aged twenty-nine years, is one of eleven children, the parents of whom are still living and in good health. The family history is singularly free from neurotic disorders of any kind, and of the four deceased children, pneumonia appears as the cause of death in two, and typhoid fever and cholera infantum as the cause in the two other instances. At the age of five years the subject of this paper suffered from convulsions, the attacks, judging from the meagre details at hand, being doubtless of an epileptic character, and continued until about the age of ten, when they ceased. During the period of infancy the only diseases noted were measles, pertussis, and chickenpox.

"The question of traumatic injury of the head presents in this case the usual misfortunes incidental to the early period of life. At the age of eight is recorded a fall on the curbstone, and a few days later a blow over the eye from a stone, but at no time were any untoward symptoms manifested as a result of the injuries in question. By one of the immediate family it is related that the patient, as a boy, had frequently been struck over the head with a stick as a method of punishment, but careful and painstaking inquiry fails to reveal any symptomatic data in regard to the effect of this disciplinary measure. During the period of his early manhood the history of this case is negative, particularly in so far as relates to the inevitable resultant of a deviation from the straight and narrow path of moral rectitude. From about 1889 to 1907, a period of eighteen years, the convulsive seizures ceased, and the history of the case during that period presents nothing of interest.

"On October 20, 1907, the patient was seized with a typical attack of epilepsy, which lasted about three minutes. Half an hour later a second attack appeared, surpassing in severity the previous one, and a week later a third attack was noted. On December 18, while standing in his room, he suddenly turned around twice toward the left and fell to the floor with an attack of epilepsy: twenty minutes later he was the victim of a second attack. In a few days the patient became suddenly possessed of the idea that he owed large sums of money, and that unless the accounts were speedily settled the supposititious creditors would do him bodily harm. He refused to see the friends who called upon him, and spent the day in devising ways and means to slip out the back way at night and settle the imaginary obligations. The significance of the approaching holiday season seemed lost to him; violent outbursts of temper appeared, and anything placed on the table in front of him was at once thrown on the floor. General epileptic seizures, about ten a week, now appeared, and in the interim between the attacks the patient was stupid and lethargic in the extreme. About May 1, 1908, he complained that his left arm was stiff and cold, this condition being accompanied by a severe attack of nausea. During the night he suffered from an epileptic convulsion. The epileptic attacks continued at the rate of about five a week during the months of July and August, and now the patient began to exhibit distinct signs of a rapidly failing mentality. Implements of trade were supposed to be missing which in fact were at the moment under his eyes; implements that did not exist were described and sought for. Smoking pipes and various instruments of handicraft, which had been laid down for a moment, suddenly passed from his mind, and in the vain attempt to describe and locate the same words failed him—amnesic aphasia became marked. Finally, the sentences became incomplete and incoherent, and he would sit on the floor and gaze into space. During the month of August the convulsive seizures became more marked on the left side, and

the mental deterioration was now so distinct a feature of the case that it was necessary to confine him to his room under the immediate care of his wife. About September 10 the character of the convulsive seizures changed, the loss of consciousness being less marked, but the involvement of the left arm and leg in a severe convulsive movement was only too evident in the new order of affairs. On September 12, while standing on the sidewalk, the patient, who at the time had his hand at his mouth to remove his empty pipe, suddenly dropped his left arm to his side, turned completely around toward the left three times, and was about to fall, when he was caught and placed on a bench. This attack passed away in about two minutes, during which time the patient remained fully conscious, and soon exclaimed, "I am all right"—then followed the usual hallucinations about his domestic difficulties. On September 16 a sudden and serious change for the worse appeared, convulsion after convulsion following each other in rapid succession. The left-sided character of the seizures was more marked than before, and at the end of the day over fifty attacks had been noted, leaving the patient in an unconscious and exhausted state."

Believing there was some slowly developing lesion of the right cerebral hemisphere, probably a cyst or cold abscess, and regarding the case as absolutely hopeless without surgical intervention, I operated at the Emergency Hospital, September 21, 1908. A large osteoplastic flap was turned down from the right temporoparietal region and the whole Rolandic area exposed.

To my surprise the brain was not edematous, but the tension was very great, and no pulsation could be felt or seen. A grooved director was carefully introduced in half a dozen different places and directions in search of a tumor or cyst or abscess, but nothing was found. I was so sure there must be some growth or cyst to cause the great amount of tension, that I carefully introduced my finger into the fissure of Sylvius at least three inches and again into the substance

of the occipital lobe, palpating the occipital lobe with one finger in the centre of it and one on the surface, but nothing was found. I replaced the flap, still feeling that there must be a growth in the brain, but not feeling justified in any further exploration.

I gave his wife a gloomy prognosis. The day after the operation he had thirty-nine convulsions, on the second day seven, and on the third one. Since then he has had none. In a few days he began to improve mentally, leaving the hospital three weeks after the operation considerably improved.

For his subsequent history I again quote Dr. Craig:

"The rapid disappearance of the outward manifestations of the malady is strongly in evidence in the general appearance of the patient. This marked improvement, as indicated in the animated facial expression, is in striking contrast with the stupid and inanimate expression which characterized the preoperative state. In the place of a distracted intellect, incapable of manifesting anything approaching human intelligence, the case now attracts unlimited interest in view of the rapid restoration of the psychological faculties. The power of perception, once obtunded to a degree approaching imbecility, has reappeared, and once again is evidenced by the interest the patient takes in the every-day affairs of life. Friends are once more recognized, photographs are handled in a spirit of recognition, the power of coherent and intelligible speech appears. As if by magic the hallucinations have disappeared, and not for a moment have the delusory symptoms, which but a few weeks ago were of hourly occurrence, put in any appearance. Taking an interest in the topics of the day, he is able to discuss fairly well the patients in the hospital ward, recounting the names of the patients, and in one instance, that of the disease (aneurysm), frequently refers to the 'famous heart stitching case,' and notes the progress of the same in the daily papers. The names of the hospital doctors are remembered; likewise

the frequent visits of the numerous members of his immediate family. Loss of memory has given place to a retentive state of mind, while the power of association enables him to pursue his daily vocation—that of janitor and general utility man in an apartment house—without forgetting the floor he is on or the names and faces of the occupants. A curious feature of the case is found in the fact that the patient is able to recall the hallucinations from which he has suffered during the past few months, describe them in detail, and note the marked change in his own mental condition.

"For a few days after the return from the hospital the patient was obliged to use a cane in walking, owing in part to general weakness and in part to a want of power in the muscles of the left leg, but these symptoms have almost entirely disappeared, and he is able to travel without difficulty at any time, day or night."

A recent note from Dr. Craig (six months after operation) tells me that he is now apparently as well, mentally and physically, as ever; and that he has been on top of a high stepladder, washing windows, and doing all his work without difficulty. This case might have got well without the operation; but I do not believe it. He had been sick too long, and was rapidly progressing from bad to worse. He may not be permanently cured, but there has been sufficient improvement, even if he should relapse tomorrow, to more than justify the operation.

As I have said before, there is no question as to the propriety of operating in certain cases of epilepsy, but my results have been so encouraging that I feel that they justify further trial in cases of idiopathic origin, or obscure origin, even when of long standing. Every case of epilepsy should be carefully studied. Particular attention should be given to the alimentary canal and to sources of peripheral irritation. But when careful medical treatment fails, and no extracranial cause, and no peripheral source of irritation can be found, I believe these cases should be operated upon for the following reasons:

1. Because they are otherwise absolutely hopeless, unable to enjoy life, and a nuisance, or even a menace, to those who have to care for them; for they frequently develop attacks of homicidal mania.

2. Because some, even of the worst cases, may be cured. And it is impossible to foretell which cases can and which cannot be cured.

3. Because those not cured are usually benefited temporarily to a sufficient extent to make them glad they had the operation.

4. Because there is so little danger in the operation. All my cases recovered from the operation, and all that I know of personally have recovered. Nothing has surprised me more, in a long experience with Emergency Hospital work, than the liberties that can be taken with the brain without any bad results, and the apparent great resistance of brain tissue to infection with pus-producing organisms.

5. The lack of pain and discomfort following operations upon the brain.

These cases make more rapid, easy, and comfortable recoveries than we get in other operations of anything like equal severity.

The best method of operating, I think, is to make a large osteoplastic flap over the region to which the focal symptoms point, or if there are none the flap may be made so as to expose the Rolandic area on either side. This can be rapidly done with a good De Vilbis craniotome, but not with one that has been bent or twisted out of shape. It gives plenty of room for examining nearly the whole hemisphere and for tying such bleeding points as are bound to occur. A large crucial or triangular incision should be made in the dura, and a careful examination made for pachymeningitis, depressed bone, newgrowths, or any other suspected lesion. Any offending body should be removed. No harm results from removal of a large amount of thickened dura when there is an osteoplastic flap to cover the wound, but this would be dangerous when much bone had been removed with the

trephine or rongeurs, as cerebral hernia would be likely to follow. Edema should be drained by the careful introduction of grooved directors into the brain substance. In some cases serum flows in streams, and the translucent brain may be seen to shrink and become opaque in a few moments. Several directors may be introduced at once. Of course, no lateral movement tearing the brain should ever be made. Exploring needles are useless. A soft rubber drain may be put just through the dura and brought out through one of the small trephine holes. Sometimes gauze packing may be used in the same way to prevent oozing, but remember that gauze does not drain. I have thought it possible that my good results were due to the large opening and wide inspection of the brain, and that the absence of bad results, particularly cerebral hernia, may have been due to the replacing of the bone flap. Certainly, cases 3, 6, 7, 8, and 9 in the appended table where a small depressed fracture was cut out or the opening made with a trephine did not do so well as numbers 1, 2, 4, 10, 11, and 16 where the more extensive operation was done. And yet they were apparently more favorable cases.

Appended will be found a tabulated report of all my cases of operation for epilepsy.

No.	Date.	Sex.	Age.	Color.	Duration.	Symptoms and description.	Condition found. Operation.	Result.	Remarks.
1	November 11, 1898	M	30 years	W	2 years	Blow on head from fist; unconscious one hour; attacks began at once; one or two a day.	Edematous brain; thickened dura over temporal region where blow was received; drained.	Cured 4 years.	Operated at Emergency Hospital; well when last seen, four years later.
2	April 10, 1899	M	27 years	W	17 years	Attacks began in childhood, sometimes long intervals; sometimes seizures five or six times a day; had to give up work as a barber on account of fits getting worse and more frequent. Had no fits for six months, then they returned, and patient begged for second operation. This was done after trying bromides for two months.	Dura thickened; brain very edematous, translucent; after draining with grooved director brain became opaque and shrunken; large osteoplastic flap gauze drain; second operation, old flap turned back; same condition as at first operation; drainage tube inserted under dura; copious flow of serum for three or four days.	Cured 9 years.	Referred by Dr. E. L. Tompkins; operation at Emergency Hospital. After the second operation the patient had a few slight attacks for a year; none since; has married, resumed work at his trade, and has four or five children.
3	January 23, 1899	M	18 years	W	3 years	Had several blows on head when a boy, but these had no connection with fits, which began when he was fifteen and occurred two or three times a week until operation.	Focal symptoms pointed to left arm centre; trephined; edematous brain found; nothing else abnormal; drainage tube kept in several days.	Improved.	Referred by Dr. Wm. N. Fisher, who assisted in the operation at patient's house. Free from attacks for about three months, when they recurred about as before.
4	June 22, 1899	M	26 years	W	Several years	Apparently idiopathic; had several attacks of influenza during last three years; had twelve epileptic fits the last three days before operation.	Large button of bone removed about left parietal eminence; brain edematous; linear craniotomy; drainage tube inserted.	Cured 8 years.	Operation at Emergency Hospital. Patient had a few seizures during the first five days; none since leaving hospital when last heard from in July, 1907.

5	April 2, 1901	M	"50" years	W	1 month	Struck on head with a brick ten years ago; scar, but no symptoms until after attack of influenza two months ago; this was followed by stupid mental condition, partial paralysis of both legs and arms; more marked in legs; numerous epileptic convulsions.	Large osteoplastic flap turned down over seat of injury; no sign of injury found, but a general edematous encephalitis.	Cured 7½ years.	Referred by Dr. Richard Washington; operation at the Emergency Hospital. Mental symptoms, paralysis, and epileptic seizures all disappeared; could walk to bath room three weeks after operation; was still well when heard from recently.
6	June 1, 1901	M	20 years	W	6 mos.	Depressed fracture in upper parietal region; six months later epileptic seizures began and continued irregularly to date of operation. In all about twenty fits.	Slight depression of skull in upper parietal region removed with trephine and rongeurs; brain edematous.	Improved.	Operation at Emergency Hospital; relieved for seven months; seizures then began again, but were not so severe nor so frequent as before operation; lost track of patient in 1903.
7	March 7, 1903	M	18 years	C	Unkn'n	No history of trauma that could account for his condition; epileptic seizures nearly every day, sometimes twice a day.	Edematous brain; button of bone removed from left parietal region and linear craniotomy done.	Improved temporarily.	Operation at Emergency Hospital; temporary improvement lasting about two months.
8	April 23, 1903	M	33 years	W	8 mos.	Seizures began about two years after a depressed fracture in right occipital region, and were occurring nearly every day.	Trephined; depressed bone removed; edema of brain noted.	Unknown.	Had one seizure in Emergency Hospital seven days after operation; not heard from after leaving hospital on nineteenth day.
9	January 10, 1904	M	9 years	W	1 week	Fell down a bank six feet high, striking head, which was cut badly; several weeks later had three or four well-marked epileptic seizures.	Slight depression in upper parieto-occipital region; triangular depression of inner table; removed with large trephine; thickened dura removed; brain slightly edematous.	Temporary improvement.	Referred by Dr. T. F. Keen; operation at patient's home near Hamilton, Va.; was well for about five months when seizures returned, still has about one a week.

No.	Date.	Sex.	Age.	Color.	Duration.	Symptoms and description.	Condition found. Operation.	Result.	Remarks.
10	October 19, 1904	F	26 years	W	1 year	History of blow on head; attacks began two years later; seizures during past year averaged two a week, but were irregular in interval.	No evidence of injury; osteoplastic flap at site of blow, upper right parietal region; brain edematous; no other lesion found.	Improved.	Operation at Garfield Hospital; three convulsions while in hospital; then had none for seventeen months, when they began again.
11	November 12, 1905	M	38 years	W	Several years	Had a depressed fracture of occipital bone; epilepsy followed; attacks frequent for days, then interval of several weeks; mind much impaired, especially during seizures; became dangerous, burning haystacks and committing other acts of vandalism on several occasions; got drunk whenever possible.	Depressed fracture just back of right ear; cavity in skull three-quarters inch deep as large as a silver dollar; osteoplastic flap made; spicule of inner table removed from brain; flap sawed and broken so as to turn the convexity outward; thickened dura removed; much serum drained from edematous brain.	Cured 3½ years.	Referred by Dr. Joseph Milton, Hamilton, Va.; operation at Emergency Hospital; patient has had no seizures since operation; mental condition much improved; no further vandalism.
12	June 2, 1905	M	31 years	C	About 25 years	Attacks at intervals since childhood; sometimes free for several years; worse of late, having two or three severe attacks every few days.	Attacks began by jerking of left foot and leg; large osteoplastic flap over right rolandic region; no lesion found except very marked edema.	Unknown.	Operation at Emergency Hospital; had one convulsion in hospital; nothing heard of him since leaving there.
13	February 4, 1906	M	30 years	W	2 years	Struck on head ten years ago; had much pain and aching there ever since; for last two years has had epileptic attacks, growing worse rapidly; patient almost imbecile.	Osteoplastic flap over frontal region, where old fracture occurred; no lesion found except some evidence of fracture of outer table; edema not present.	Not improved.	Operation at George Washington University Hospital; patient's mental condition continued to grow rapidly worse, though he had no convulsions for a time; when last heard from he was in the Government Hospital for Insane.

14	February 11, 1907	M	19 years	W	2 weeks	Struck on head by stone, followed in few days by stupid mental condition and frequent convulsions.	Large depressed fracture at angle of lambdoid suture; edema of brain and local meningitis; bone elevated.	Cured to date.	Operation at Sibley Hospital; excellent recovery; no return when last heard from about one year after operation; referred by Dr. Henry Elliot.
15	July 9, 1907	M	30 years	W	7 years	Typical epileptic seizures since 1900, when he was struck on head with butt of a pistol; about ten a week; mental confusion requiring confinement in insane asylum.	Large osteoplastic flap over site of blow; edema of brain; cyst about one inch by three-quarters inch, apparently result of old hemorrhage removed.	Much improved.	Operation at Government Hospital for Insane, Washington, D. C.; no convulsions for six weeks; now has two or three a month; mental symptoms much improved and patient discharged from asylum cured of his insanity, November, 1907; says his fits are much less severe and frequent than formerly.
16	September 8, 1908	M	45 years	W	5 years	Had fracture of temporal region, left side; operated upon at time and much bone removed; wound discharges at times preceded by convulsions frequent and severe.	Old flap reopened and search made for cause of discharge of pus; nothing found except superficial abscess; old gristly tissue removed and edema drained.	Improved.	Patient operated on at Emergency Hospital; no convulsions when last heard from, December 1, 1908.
17	September 21, 1908	M	29 years	C	About 22 years at intervals	This case is given in full in body of paper; having fifty convulsions a day when operated on; mentally idiotic.	Very great tension of brain; no edema; large osteoplastic flap; finger introduced into brain in two places in search of tumor; none found.	Cured to date.	Referred by Dr. Henry Craig; has had no convulsions since operation, and mental condition has become entirely normal.

Three cases, notes of which are lost, and for which no details can be supplied, should be added for fairness, as I am sure these three were little, if at all, improved by operation.

DISCUSSION.

Dr. John D. S. Davis, of Birmingham, Alabama.—This paper is too important to be allowed to pass without some discussion. I believe operation for epilepsy, both for the idiopathic and traumatic forms, has a field of usefulness. While I have never obtained any permanent good in operating for idiopathic epilepsy, I have in every case obtained temporary beneficial effects when the cases were operated on early. Operations for traumatic epilepsy, on the other hand, are almost universally successful, if done early, but after years of delay and the epileptic habit is established, it will usually continue regardless of any operation. Operation will for the time being relieve the epileptic seizures, but they will recur, sooner or later. I believe that has been the experience of almost all operators, and if we can accept the experience of Dr. Carr, it means a great deal for this class of cases.

Dr. Carr (closing).—I read this paper in the hope of getting some of the surgeons to give this operation a thorough trial in the class of cases under discussion. I do not get many of these cases to operate on myself, but I am going to try it on all I can.

Dr. Davis has expressed the opinion which is generally accepted today; but I do not think the more extensive operation I have mentioned has been given the attention it deserves to warrant surgeons in giving up these cases without further trial.

Dr. Lydston.—You spoke of the operation for idiopathic epilepsy. Do you mean in the sense of limited trephining or an extensive operation upon the bone?

Dr. Carr.—I mean an extensive osteoplastic flap for examination of the brain and the removal of anything abnormal that is found as far as possible.

Dr. Lydston.—I am talking about the idiopathic variety of epilepsy.

Dr. Carr.—You will always find something the matter with the brain in the idiopathic form of epilepsy as well as in other forms of the disease. For instance, an edematous encephalitis or a pachymeningitis.

Dr. Lydston.—What is your attitude toward some of those cases that are associated with congenital brain deficiency or degeneracy? Is it your idea to relieve tension by making an extensive osteoplastic operation, or do you merely explore the brain?

Dr. Carr.—Both.

VAGINAL HYSTERECTOMY FOR CARCINOMA OF THE CERVIX.

By Henry T. Byford, M.D.,
Chicago.

The relative indications of abdominal and vaginal hysterectomy for carcinoma of the cervix are still under active discussion. The advocates of the abdominal operation have shown that it gives greater immunity from recurrence, and maintain that this comparative immunity more than overbalances the comparative safety of the vaginal operation, and are endeavoring to simplify their method so as to diminish their immediate mortality. On the other hand, those who favor the vaginal route are endeavoring to develop a more radical method and thus diminish their later mortality.

Emil Ries, the first and most consistent operator by the new abdominal method, emphasizes the fact that a complete removal of the pelvic connective tissue is necessary to justify the operation, while Wertheim, its German representative, recommends a less thorough clearing out of the sides of the pelvis in order to avoid excessive hemorrhage, and a less radical stripping of the ureter in order to avoid ureteral necrosis and fistula. Other alterations of the technique designed to save time and diminish the amount of the anesthetic used, and thereby lessen the shock and hemorrhage, are being tried.

Staude, a warm advocate of a more radical vaginal operation, has made a study of the postmortem examinations of 15 patients who died as the result of hysterectomy for

carcinoma, and nearly all of which were cases of advanced disease. In 9 of them no infected glands were found; in 2 of the remaining the pelvic glands were free of disease, although in one a diseased gland was found behind the duodenum and in the other at the junction of the renal artery with the aorta; in one case the inguinal glands were infected, and in 3 cases in which the pelvic glands were infected there was also extensive invasion of those of the lumbar region. Thus, in 60 per cent. of the deaths from the operation there was no discoverable glandular infection, and in the remaining 40 per cent. the removal of all infected glands would have been impossible.

Schauta, who included all of those patients who died of cachexia in his investigations, has reported 80 per cent. free from glandular extension and that the removal of all infected glands would have been impossible in the other 20 per cent.[1] Staude's study of the literature revealed that in from 26 per cent. to 60 per cent. of cases the glands are diseased. Removal of visibly or palpably diseased glands can, of course, be accomplished by the abdominal method, but when they are so affected, invisible and impalpable or remote infection usually exists, and the mere enucleation of what is seen and felt to be diseased will seldom prevent recurrence.

Thus, we see that in many advanced cases the glands are not invaded, and that even when they are they cannot always be removed. Hence, we must hesitate before we advocate the abdominal method indiscriminately.

Staude, in 104 cases operated upon per vagina, as radically as possible with the aid of bilateral vaginal incisions, reports 39 returns of the disease. He says:[2] "The majority of returns were in the scar, or in the contiguous stump of the parametrium, close to the scar. I seldom saw a return in the glands (only three times, once in the inguinal and twice in the iliac glands) without infection of the scar." He says that he

[1] Monatsschr. f. Geb. u. Gyn., Band xix, Heft 4.
[2] Zentralbl. f. Gyn., 1908, No. 37.

saw a return in the paravaginal connective tissue. These facts correspond with my own experience, and, if representative of the general experience, show that the returns are in the regions that are most accessible by the vaginal operation. And the object of this paper is to recommend a procedure that secures the removal of more of the connective tissue in these regions and thus tends to improve the remote results.

Let us divide the cases into two classes, viz., those in which the parametrium is not sensibly invaded, and those in which it is, and consider them separately.

In the first class the cervix can be pulled down and the parts made accessible from below. It then becomes easy to judge of the amount of vagina to remove with the cervix, and easy to remove it. In passing, I would like to state my belief that the remote results of the vaginal method are much worse than they should be because the error is so often made of not removing enough of the contiguous vaginal walls and connective tissue. We can operate close to the rectum behind and enter the peritoneal cavity at the bottom of the pouch of Douglas, and then push up the connective tissue under the sacro-uterine ligaments. After entering the peritoneal cavity in front we can also push the ureters well up out of the way and thus be free to ligate the bases of the broad and sacro-uterine ligaments well out from the cervix.

In order to remove the connective tissue as far away from the cervix as possible, I have made use of a combination ligature and forceps method. First, I ligate the broad and sacro-uterine ligaments, but use strong silk thread tied as tightly as possible and leave the ends long enough to protrude from the vulva. After severing the ligaments pretty close to the ligature, I grasp one of the stumps with forceps, pull it down, and put a short, strong pair of broad ligament forceps as far away from the ligatures as possible and clamp it so tightly that it will cause a slough. I have sometimes been surprised to see how much farther from the cervix I could thus grasp the tissues than by either the ligature or the clamp

forceps alone. The same is done on the other side. As there is but one pair of forceps on either side, I find no difficulty in uniting the peritoneal to the vaginal edges in front and behind and in partly closing the vaginal vault between the forceps, leaving sufficient space on either side for drainage and for the slough to come away with the ligatures.

In the other class of cases, viz., those in which the vaginal edges and parametrium are invaded, Schuchardt's vaginal incision, that enters the tissues deeply to the right of the rectum and terminates in the posterior fornix, or Staude's bilateral splitting of the vaginal canal into the parametrium, may be employed. By means of Staude's bilateral splitting method one can reach the diseased parts and loosen the uterus and obtain free access to the pelvic connective tissue. After the bleeding vessels are ligated and the uterus pulled down, the operation can be completed in the ordinary way. As a final step, the vaginal incisions are sutured and the connective tissue drained.

I have not gone into the detail of the use of these long vaginal incisions, with their advantages on the side of radicalism, and their disadvantages on the side of danger to life, for that would lead me far beyond my subject, which was to suggest an improvement in one of the steps of the operation rather than open up a discussion of the operation in all of its phases. What I wish to emphasize is that, before giving our adherence hastily to the plausible but exceedingly dangerous abdominal method, we should develop the possibilities of the vaginal route, and I have offered minor suggestions looking to that end.

I have devised this pair of forceps, which, I think, obviates some of the objections that are found to the ordinary broad ligament forceps. Most forceps project too far into the peritoneal cavity and cause pain; they sometimes fail to grasp the tissues firmly at all points, and thus may not cause prompt and complete sloughing; and they project too far out of the vulva and are in the way externally. The forceps I

have here are short, and thus not only hold the stump down near or at the vaginal edges, but they do not form a large mass of metal projecting between the thighs. They are blunt and slightly hooked at the end of the blades, and thus not only do not scratch the intestines, but do not allow the pressure to force the edge of the flattened stump beyond their grasp. They are strong enough to exert a uniform pressure that causes sloughing even when left on but a few hours. I usually leave them on for twenty-four hours, although ten or twelve would probably be long enough.

DISCUSSION.

Dr. William M. Polk, of New York City.—This paper is far too important to pass without some expression of opinion from the members of this Association.

The question as presented by Dr. Byford can be narrowed down to those cases in which there is a minimum amount of extension of the disease outside of the initial lesion. In these cases there can be no question as to the kind of operation that should be done; the only question as presented by his paper, is the direction one should take in doing the operation. It is not worth while to enter into the reasons which will influence a good many of us in selecting one route as against another. I would simply say that we recognize that carcinoma not infrequently occurs in women with conditions of the vagina and pelvis which make the vaginal operation difficult to those who have not acquired a considerable degree of expertness in handling the organ from that direction. It seems to some of us that in cases of this sort, particularly as they represent a class in which the condition of cachexia has not advanced sufficiently to produce any very serious vital impression, that the better plan is for the operator to select that route with which he is most familiar. In other words, in advocating operation of this sort, the best plan to pursue is that form of operation which can be handled by the largest number of expert men. The direction I have in mind is one which I believe many of us agree upon as being the best in undertaking so serious a procedure. The only question is, how shall we go at it?

If we can rest our minds upon one point, and that is rapidity of procedure, and make them up to do the radical operation, ligation, or the internal iliac, and then fix our attention upon the most difficult or supposedly most difficult part of the problem, we will first be surprised at the ease with which this can be done, and that being done, the amount of hemorrhage which will accompany our work is so slight it can be neglected. Mind you, sir, I am speaking of cases in which cachexia has not advanced to a bad point. The moment you have gotten rid of the prospects of hemorrhage, you have at your command procedures that can be expeditiously carried out, which result in speedily isolating the uterus and removing the connective tissue of which the essayist spoke; you then are in position to follow out the suggestion of Werder, removal of the detached mass, through the vagina, avoiding the possibility of infecting the peritoneal area which is a point that has been argued against this method of procedure. I would urge that in the class of cases the essayist has spoken of, by far the better plan for the largest number of operators will be found along the lines I have ventured to suggest.

Dr. Rufus B. Hall, of Cincinnati, Ohio.—I doubt very much the advisability of subjecting these patients to abdominal instead of vaginal hysterectomy, as a rule. I believe the judgment of the last speaker is not to the best interest of the patient. I believe that statistics of the ultimate results would justify that conclusion. In the first place, the primary mortality from this wide dissection by the abdominal operation is greater than the primary mortality of the vaginal operation suggested. It is a greater operation, necessitates wider dissection, and the ultimate results do not justify the additional primary mortality. Therefore, for the present, I believe the greatest good will come from the vaginal operation rather than from this wide dissection by the abdominal route. While I grant the operation done through the abdomen is easier for the operator unless he has perfected his technique for vaginal work, yet the primary mortality is higher, and therefore the best operation for the patient is the vaginal.

Dr. Frank D. Smythe, of Memphis, Tenn.—I am of the opinion unqualifiedly, based upon an experience of some few cases, that the ones that should be subjected to operation

should be operated on by the vaginal route, for the reason Dr. Hall has stated, namely, if the disease has extended so that it cannot be removed without entering the abdomen, the patient is subjected to unavoidable risk and the ultimate results in those cases are that if they do not die immediately as the result of the operation, they succumb because metastasis has long since gotten beyond the point of operation.

Our only hope for diminishing the frightfully high mortality rate of cancer of the neck of the womb is the recognition of the disease while it is essentially a local lesion, and unless you recognize it at that time, and be careful about not infecting the incision, when you are making an operation around the uterus and vagina, you will always have recurrence in the scar; and if the disease has gone beyond your ability to effect its complete removal, at the time of the original operation, the patient has been subjected to unnecessary expense, and her last condition is no better than the first; and if the disease has reached the point of inoperability, then the question of removing the fungating mass and the application of the hot iron is, in my judgment, the most effective as a palliative measure.

Dr. Henry T. Byford (closing).—I would like to explain my position a little more clearly. In the first place, I did not say much about the abdominal method, except its dangers, and I did not say much about the extensive vaginal incision because it is still on trial, and adds to the danger. I called attention to the fact that in those cases that were still operable it might be possible to get beyond the invaded tissue; that in a large proportion of cases the upper glands were not invaded; and that where the infection had extended to the lymphatics these cases would not be helped from above. As the extension of the disease was below, often the return is below, and I tried to propose a method by which in these operable cases we could get farther away from the cervix and perhaps stand a better chance of removing all of the infected perivaginal tissue than we could by operating from above.

CANCER OF THE PAROTID GLAND.

REPORT OF FIVE CASES.

By George A. Hendon, M.D.,
Louisville, Kentucky.

Incidence. I have been astonished at the rarity of the occurrence of this malady as indicated by published reports. The five cases here referred to include the whole number of cases which I have seen either in my own work or that of my colleagues, although a few days ago Dr. Sherrill showed me the photograph of a patient upon whom he expected to operate, and which had the appearance of cancer of the parotid.

In 1892 H. Bohme collected 411 cases of tumors of the salivary gland, 90.51 per cent. appearing in the parotid. I have succeeded in finding references to fourteen scattering cases and 26 cases reported by Dr. Francis Carter Wood, in the *Annals of Surgery*, vol. xxxix, making in all 417 cases reported to date, including the 5 cases of the writer. Dr. W. W. Keen makes an interesting report of a case in the *Journal of the American Medical Association*, vol. xlii, p. 1138; also Dr. Cordier, same journal, vol. i, p. 138.

History. The knowledge of the histology and the clinical manifestations was very meagre up to the second half of the nineteenth century. Von Bruns, in 1859, was the first who described neoplasms of the parotid from his own cases as well as those of foreign sources, giving the clinical, macroscopic and pathological anatomical features. C. O. Weber added markedly to the causes. The histological studies were notably furnished by Billroth and Virchow, the latter making a special

study of enchondroma. More recently, Kaufman and Nasse have worked out the histology of the various tumors of the salivary glands and gave special study to those forms of the mixed variety connective-tissue substance and epithelial. (H. Bohme.)

Etiology. Billroth, in his work on the subject, says the seat of the growth is more often found in the parotid gland, especially in that part situated below and in front of the ear than in the submaxillary. Trauma is said to play a most important role. Billroth mentions two cases from a blow over the parotid.

Kaufman collected 29 cases with the tumor on the left side in 17 and 12 on the right. C. O. Weber believes that inflammatory processes might be of etiological moment, especially repeated attacks of facial erysipelas, toothache, and colds. Cohnheim thinks that enchondroma is of fetal origin by including the cartilaginous elements in the branchial arch. Parotid tumors show microscopically all the varieties of connective-tissue epithelial substance. Bohme collected 372 cases from the literature as follows:

	Cases.	Per cent.
Sarcoma	128	34.41
Carcinoma	96	28.81
Enchondroma	58	15.59
Fibroma	17	4.57
Myxoma	15	4.03
Adenoma	11	2.96
Lipoma	9	2.42
Not classified	38	10.21

Billroth reports two cases of cancer with operation and recovery. He does not agree with Bohme, whose statistics are here given showing 96 cases of carcinomata in 372 or 25.81 per cent. He thinks these figures are too high and that in more recent literature but very few cases of parotid cancer are reported.

According to the monograph of Kaufman and Nasse a part of these cases formerly described as carcinoma were in reality

not epithelial growths, but endotheliomata, *i. e.*, tumors belonging to the connective-tissue groups. Recent statistics show that the disease is comparatively rare. Nasse found only two cases in thirty-three tumors. In Billroth's two cases they occurred in elderly persons, a rule which applies to cancer in other situations. In Bohme's statistics of 87 cases the age was as follows:

Age.	Cases.	Per cent.
1 to 10	3	3.4
11 " 20	7	8.1
21 " 30	17	19.5
31 " 40	8	9.3
41 " 50	11	12.7
51 " 60	19	21.8
61 " 70	17	19.5
71 " 80	3	3.4
81 " 90	2	2.3
Total	87	100.0

From this table it will be seen that the disease is especially frequent in advanced age; most striking, however, is that the second most often occurrence is in the third decade, 17 cases or 19.5 per cent. One explanation of this is, as stated above, sarcomata were formerly reported as carcinomata. The disease is decidedly more prevalent in the male in 90 of Bohme's cases; 57 were in males and 23 females. Horace Read (*Amer. Jour. Clin. Med.*, 1907, xiv, 337) is of the opinion that sarcoma and carcinoma occur in frequency about equal. With reference to age, Dr. Francis Carter Wood (*Amer. Surg.*, xxxix, p. 210) makes the following observation in a study of 59 cases of mixed tumors of the salivary glands:

Four tumors appeared in the first decade; one in the second; thirteen in the third; eight in the fourth; nine in the fifth; four in the sixth; and three in the seventh. In my short series of five there were two in the sixth and three in the seventh, and they were all in men.

Pathology. I don't believe this phase of the subject can be better presented than by copying Wood's conclusions

in the article above referred to. (*Amer. Surg.*, vol. xxxix, p. 233.)

1. "There is a group of extremely complicated tumors occurring in the facial region which contain elements from both epi and mesoblast in most intimate relation to each other.

2. "The complicated structure of the stroma, containing as it does elements such as embryonic connective tissue, cartilage, bone, fat, and lymphoid tissue and very rarely striated muscle, is explained most easily by the assumption of an embryonic misplacement of mesoblast.

3. "The structure of the parenchyma is so slightly characteristic in morphology that its epithelial nature in all cases can only be considered as probable; yet in about 34 per cent. of the tumors examined the presence of epithelium is undoubted. The form and relationship of cells of the parenchyma do not furnish sufficient data to justify these cells being regarded as of endothelial origin.

4. "The theory of early embryonic displacement of epiblastic tissue during the process of formation of the parotid and submaxillary glands and the branchial arches may account for many morphological peculiarities of the cells of these tumors, especially the lack of many typical features which we associate with epithelium. The same conditions may be seen in the epithelial cells of the congenital moles in which the epithelium is with difficulty distinguished from connective-tissue cells owing to its close connection with the stroma of the tumors and its undifferentiated type.

5. "The mixed tumors of the salivary glands run a clinical course strikingly different from the sarcomata and carcinomata in that they are slow growing and generally benign. The regional lymph nodes are not invaded and recurrences are likely to remain local in a considerable proportion of the cases.

Diagnosis. To avoid serious error in diagnosis one has only to remember the ordinary inflammatory reactions to which the parotid gland is prone. The history of the swelling will furnish sufficient evidence of its clinical character. The

writer recalls a memorable case of suppuration in the parotid which was traceable to the lodgement of a fragment of a chestnut hull eight months before.

Clinical Progress. Slow growth characterizes tumors of the parotid. Three of my cases had dated back more than a year when they came to operation. C. O. Weber's cases were more than a year's duration when operation was sought. Four of my cases showed ulceration through the cuticle, which seems to be a characteristic of the disease. In none of my cases was there extensive involvement of adjacent lymphatic glands. Neither was there present the familiar scene of cancerous cachexia.

REPORT OF PERSONAL CASES.

Case I.—Mr. P., aged seventy-eight years. Had always been a strong, healthy man (a farmer). Was seen in February, 1907, complaining of painful swelling of parotid. A portion of growth was excised under cocaine for diagnostic purposes. Report of pathologist was carcinoma. Operation advised and accepted.

Operation. Ligation of common carotid. Removal of growth by wide excision. Wound healed by first intention and up to the present writing there has been no recurrence of growth. But there is pronounced facial paralysis.

Case II.—Mr. J., aged sixty-four years. Seen through the courtesy of Dr. J. R. Pryor. Presented an ulcerating swelling over the site of the parotid. Operation June 17, 1906. Recurrence. Operated second time September 4, 1906, with ligation of common carotid artery of same side. Apparently cured.

Recurrence and operated the third time December 9, 1907. The ulceration now extended into the middle ear. The external growth removed by Paquelin cautery. Erysipelas developed January 8, 1908, and continued three weeks. This caused the granulating surface to heal rapidly. Healing pro-

gressed to margin of external auditory canal and ulceration again extended over surface as large as a dollar and discharge form auditory canal began. This patient is in very good nutrition now, but there is undoubted involvement of the middle ear.

Case III.—J. B., aged seventy-seven years. Referred by Dr. Pryor. Ulcerating tumor of parotid. First operation March 23, 1907; second operation June 23, 1907. The latter time ligation of common carotid was performed. Complete recovery up to present time.

Case IV.—M. H., aged seventy-one years. First operation by Dr. Butler in May, 1907. Was operated upon by writer December 9, 1907.

This case was the worst of the group. Ulceration had destroyed the whole external ear and excavated most of the gland and covered a surface from the angle of the jaw to the outer canthus and back over the mastoid.

First step of operation was ligation of common carotid; then with Paquelin cautery the involved area was removed down to the bone. The man had erysipelas January 4, 1908, which continued three weeks with apparently beneficial results.

A personal note from Dr. Pryor, who sent me the case, records that in June, 1908, the surface had almost healed, but slight nodule appears at the upper and post nodule of the wound.

This patient succumbed in October, 1908, to the effects of the cancer.

Case V.—J. S., aged sixty-six years. Referred by Dr. Pryor. Ulcerating tumor of parotid. Ligation of common carotid, excision of tumor with prompt recovery.

The only feature of technique worthy of note in connection with this series is that of ligation of the common carotid. We have here presented five instances of carotid ligation in old people without any untoward symptom or sign of disturbance.

I was taught by operating on these five cases the value of the

near sitting posture as an aid to the control of hemorrhage. Also, I learned the ease and rapidity and security attendant upon the removal of growths in the neck region after ligation of the common carotid.

The group of personal cases herein reported shows recovery of 3 cases, or 60 per cent.; 20 per cent. not cured, and 20 per cent. still alive, but reëstablishment of the growth.

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DISCUSSION.

Dr. Frank D. Smythe, of Memphis, Tenn.—I should dislike very much to see this paper go by without discussion. The doctor brought out one point that I would like to discuss, for the reason that I have had three cases in the past two years in which I had to resort to a procedure somewhat similar. One case, a man, had a tumor involving the submaxillary and cervical glands to the extent that necessitated a very extensive operation, involving the entire side of the neck. In the second case the tumor was on the right side. In two cases the cancer was on the left side and in all the cases it was deemed necessary to ligate the carotid and internal jugular for the reason that they were apparently involved in the mass, and while it appeared to be a mammoth undertaking for me it was found necessary to do it in order to effect the removal of all the diseased structures.

The pneumogastric nerve was removed in one case along with the artery and vein. The preliminary ligation of these vessels rendered the field practically bloodless and the

operation could be performed as safely and satisfactorily as if one were operating upon a cadaver so far as concerns hemorrhage.

These patients were all elderly subjects, two males, one female, and recovered from the operation. One of the patients, whose internal jugular was ligated, immediately turned blue, or became cyanosed, and it looked for a few minutes as though he was going to die, but he did not, and there was nothing at all unpleasant or complicated in the postoperative management of this case.

We can, without fear, ligate the important vessels in the neck as a preliminary measure and render the operation comparatively safe, and this is the only way that we can remove all the cancerous tissue when the structures are extensively involved.

Dr. G. E. Gavin, of Mobile, Alabama.—I was very glad to hear Dr. Hendon bring out the point of absence of involvement of the lymphatics in this condition. I have noticed this frequently in old people. Just why there is an absence of involvement of the lymphatics in these cases I do not know, but I have observed that the lymphatics adjacent to malignant growths do not become involved as early and as readily in old people as they do in young people. Evidently absorption is not so rapid. Like other parts in old men, they do not act so quickly and the changes are not so rapid. This one point would be in favor of operating on older people for malignant growths, whereas it would not obtain in the younger people.

Dr. Hendon (closing).—There was another advantage I expected to gain by preliminary ligation of the arteries, in addition to freedom from hemorrhage, and that was to produce anemia in the affected parts.

Another point in connection with these cases is the resultant facial paralysis. In three of the cases I was able to dissect out the facial nerve and save it, in that way avoiding a resulting facial paralysis. While this is not such an important point in people of advanced age, still it is one worthy of some consideration.

REPORT OF A CASE OF ABDOMINAL ANEURYSM TREATED BY WIRING.

By Murat Willis, M.D.,
Richmond, Virginia.

The cure of aneurysm affecting the larger bloodvessels of the body is a question that has given much concern to medical men for many years. In attempting to formulate a rational treatment for this serious condition, surgeons have been particularly active and by some it is classified as a distinctly surgical disease. A study of the literature, however, is not very encouraging, and, in the light of our present knowledge, it must be confessed that the rational treatment of this malady, either surgical or medical, has by no means been attained.

It is the purpose of this paper to place on record one case of aneurysm of the abdominal aorta, treated by the insertion of a wire through which a galvanic current was passed after the wire had been introduced. At the same time attention is called to the previous similar operations, which as collected from literature are 20 in number. A critical analysis of these 21 cases brings out several facts from which important conclusions may be deduced.

The case which I wish to report was a negro, aged thirty-two years, whose occupation was that of Pullman car porter. He was referred to the surgical services of Dr. George Ben Johnston from the practice of a Richmond physician. The patient had enjoyed perfect health until June, 1907, and denied all history of lues. At that time he began to suffer

with occasional attacks of diarrhea which have persisted up to the present time in spite of treatment. He now has from five to ten stools a day, which are watery, offensive, contain a slight amount of mucus and blood, but there is no tenesmus. Three months ago he began to suffer with severe pain in the region of the umbilicus, with frequent colicky exacerbations. This lasted for nearly a month, but has not since returned. Following this, he noticed considerable throbbing in the abdomen. Physical examination showed a distinctly emaciated patient, who was moderately anemic. The heart and lungs were clear throughout on percussion and auscultation. In the abdomen there was a visible prominence in the right hypochondrium. On palpation over this area there was a long, rough, systolic thrill which on auscultation gave rise to a bruit that was so loud as to almost hurt the ears. The tumor appeared to be the size of a small cocoanut and was situated just above and to the right of the navel. There was very marked expansile pulsation. A distinct diastolic shock could be made out in addition to the systolic bruit. The abdomen was elsewhere negative. Both femoral pulses were distinctly felt and were synchronous in time. An examination of a specimen of fresh stool showed that it was liquid with small yellow masses like milk curds and two small particles of dark red coagulated blood with a slight amount of mucus. Microscopic examination was negative for amebæ and other parasites.

Patient was operated upon on March 28, 1908, under ether anesthesia by the drop method. A median incision was made and exposed the tumor, which appeared to arise from the aorta just below the celiac axis. The tumor was distinctly sacculated and came off on the right side of the aorta. A needle, covered with lacquer, was inserted into the sac with its point away from the aorta and through this 11 feet of silver wire was fed to form a coil. Following this the electric current was passed as follows: 10 milliampères for twenty minutes; 20 for ten minutes; 30 for ten minutes; 40 for about five minutes. When this had been raised to 40 milli-

ampères, the patient's condition suddenly changed, the pulse went up to 140, and it was necessary to give artificial respiration for several minutes. He gradually reacted, however, and the needle was removed without hemorrhage and the patient was put back to bed. Recovery was without incident. The notes of a physical examination three weeks after operation showed, as we thought, a tumor of distinctly smaller size with less marked pulsation, and patient stated that the pain was very much less. One month after operation he left the hospital and two weeks after this he walked sixteen squares to present himself at the clinic. At this time he complained that the diarrhea from which he suffered previous to operation was again giving him trouble. On account of this he was unable to go back to his work as Pullman car porter, but took up a lighter occupation. Three months after operation the diarrhea increased in severity and he had repeated hemorrhage from the bowels and died in forty-eight hours after the bleeding commenced. It was impossible to obtain a complete autopsy or to get the relatives to consent to our removing the tumor. A partial autopsy, made through an incision at the site of the original wound, showed the abdominal cavity entirely clean and free from any evidence of either hemorrhage or infection, and we believe that the sac ruptured into the bowel. On palpating the sac the coils of wire could be very distinctly felt through the thin walls and there was absolutely no evidence of any clot formation. Although before death we were satisfied that the tumor was reduced in size and that there was less pulsation, still at the autopsy there was no evidence to support such a view. The wall of the sac could be easily compressed between the fingers and would evidently have collapsed entirely were it not for the framework of wire.

The first attempt to cure an aneurysm by the insertion of a wire was made, in 1864, by Dr. Moore, of the Middlesex Hospital. He inserted 78 feet of wire into a thoracic aneurysm on the theory that the first indispensable condition for the cure of aneurysm is to provide a means of eliciting fibrin from

the blood, and a second like condition is to extend the surface within the sac on which the fibrin may be deposited. This method was not applied in the case of an abdominal aneurysm until twenty years later, when Loreta, in 1884, introduced 6 feet of fine wire through a trocar. In this case there appears to have been an almost instant relief of symptoms and a progressive improvement for ten weeks succeeding operation. Thirteen weeks after the sac was wired, however, the patient suddenly died from rupture of the aorta into the abdominal cavity.

A distinct improvement over the early methods was the suggestion of Corradi of passing a galvanic current through the wire after it had been introduced. This was first applied by Corradi himself in the case of a large aneurysm of the ascending aorta, April, 1879. It was not until 1892, however, that this Moore-Corradi method was employed for the cure of abdominal aneurysm. This operation was performed by Stewart, of Philadelphia.

Summary. For the reason that aneurysm of the abdominal aorta has proved absolutely incurable by internal medication it may be regarded as one of those conditions in which a wide range of experimentation and trial methods is justified. Much has been hoped for in the Moore-Corradi method of treatment by wiring and electrolysis. Notwithstanding the fact that a technique of this operation has been perfected through most elaborate and painstaking studies and experiments, it would seem that those cases of aneurysm of the abdominal aorta in which it has been applied have terminated in disappointment to the operator.

A critical study of 21 cases thus far reported, inevitably leads to the conclusion that surgery, so far, offers no certain relief for this malady. Of these 21 cases, the subsequent history of 3 is not recorded; in the remaining 18, death ensued in every case. The duration of life after operation in this series varies from one hour to nine months with an average duration of less than fifty days. Who knows that the length

of life may not have been shortened instead of prolonged by this method of treatment? The operative technique as developed for this condition would seem to be absolutely perfect and based upon sound surgical principles, but the fact remains that this method of treatment is disappointing and the last word has not been said concerning the surgical treatment of abdominal aneurysm.

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DISCUSSION

DR. W. P. CARR, of Washington, D. C.—I had a little experience in wiring an aneurysm a short time ago, and I found a peculiar condition in the region of the aorta, in which there was a large true aneurysm surrounded by enormous folds—in other words, a dissecting aneurysm. I undertook to wire that. I put in a trocar until I had passed it about four inches before I got blood, then it spurted and I felt sure I was in the true cavity of the aneurysm or within the sac. I then introduced eight or nine feet of fine iron wire; the patient lived for two months after that, and finally died of rupture of the aneurysm into the pleural cavity.

At the autopsy I thought I was going to get an interesting specimen, which would show what the wire had done. In the meantime I had one or two *x*-rays which did not show

anything, except that when I cut in there I found my wire did not go into the aneurysmal sac, but curled up, fell on one side in this false aneurysm. I have brought with me a photograph of that man, and a photograph of the aneurysm after I took it out and cut it open. The aneurysmal sac measures sixteen inches in diameter, and is the largest one I have ever seen. I have seen two of these cases at the hospital for the insane, where autopsy disclosed two aneurysmal sacs, probably large enough to hold a quart of blood, and around the sac there was a large dissecting aneurysm which had for its wall nothing but connective tissue surrounding the artery, and of very much larger size.

Dr. John D. S. Davis.—I would like to ask Dr. Willis how he used electricity in this case, whether he used the negative or positive pole, or both poles?

Dr. Willis.—In answer to Dr. Davis, I will say that we used the positive pole on the aneurysm and the negative pole at the back.

PHYSIOLOGICAL AND ANATOMICAL RESTORATION *VERSUS* REMOVAL OF THE INTERNAL GENERATIVE ORGANS OF WOMEN.

By John Egerton Cannaday, M.D.,
Charleston, West Virginia.

It has been almost unanimously agreed that we should in many cases of salpingitis await the curative influences of nature for sometime, and in event of her failure the gynecologist should then intervene and either remove the offending pathology or correct, as far as possible, the results of previous infection. There will be either one or both of two conditions to treat, infection or the results of infection. The first will be treated by removal or drainage or a combination of both these measures. Both rather far from a realization of the surgical ideal. Small tubal or peritubal collections of pus may be absorbed. Larger collections become sterile through the strength of their own toxines—these large collections of poisonous foreign material must be removed because their presence entails too much suffering—the cramp-like colic of the pelvis and irritative symptoms produced by pressure on neighboring organs—tubes the seat of acute gonorrheal inflammation associated with a small amount of actual pus will, in many cases, be so restored to normal that an operation sometime afterward directed to the relief of pain or sterility will disclose only adhesions of tube and ovary. In some cases the fimbriated end of the tube is clubbed, otherwise the oviduct will be normal, in others the adhesions will have been so dense and destroying as to almost obliterate all semblance to normal

structures. The type last described is not very amenable to plastic treatment. These three classes are common in the practice of the surgeon who treat these patients without hurry, and seeks to relieve his patients without undue mutilation.

The social status of the woman has a greater bearing on this than perhaps any other of the more frequent surgical conditions. One has money and time, she can afford the doubtful pleasures of invalidism, hospitalism, etc., *ad libitum*, she commands gynecological skill and has the time to apply it palliatively. In a good many cases she will make a recovery almost complete in its results, so much so that its surgical completion may be a mere incident in the details of the case. In such cases we should wait, with discretion; the dangers are less than when early radical work is done. If time fails utterly to restore the anatomy of the parts, then when the physiological resistance is raised beyond par the opsonins are up. Operation is comparatively free from danger and its results are gratifying. However, in the presence of pus collections one should take care that the waiting is not prolonged until rupture takes place into the rectum and a fecal fistula is openly invited by abdominal section. If the patient is poor and dependent on her own resources, the case is not one for waiting. A prompt complete operation, the removal of the tubes, gives an assurance of a short hospital stay and an early return to the ranks of the breadwinners. She cannot afford invalidism, nursing, rest, and what not else entailed by invalidism. As a rule, neither the prostitute nor the criminal female desires a continuance of their reproductive powers. And the surgeon who places a bar between these women and conception may have reason to think himself actuated by altruistic and humanitarian motives.

We can well afford in many cases of tubal trouble to take the patient well into our confidence and give her our guidance in making a decision whether she cares for maternity or not, if she is willing to take the time and trouble to get the best out of the situation. Here we have the rights to personal liberty

and the pursuit of happiness. The non-operative treatment of these cases, is, many statements to the contrary notwithstanding, in the main judicious neglect. The numerous hot douches, tampons, and other applications to the cervix and vaginal vault having as their real purpose the diversion of the patient.

Although pelvic massage has been defined as a sort of vicarious masturbation there is no doubt but that by this method much may be done to promote absorption and elongation, by stretching of pelvic adhesions. Massage and time may do much to free a fixed uterus and nearly restore its normal range of mobility.

At times it will be necessary to remove an infected ovary, but, as a rule, resection is all that is necessary. Prolapsed, enlarged, or adherent ovaries after resection and suspension give but little trouble.

Retroverted, partially prolapsed, congested, subinvoluted uteri with their appendages can usually be nearly restored to normal by suspension, perineorrhapy, rest, etc. The teaching of some that after removal of tubes and ovaries, the uterus should go on the ground that the circulation will be interfered with is most fallacious. We all know that the pelvic blood supply is particularly rich and that the anastomoses are free—why then add to the mutilation and operative risk—why do something without good cause which may add to the sum total of mortality or one to the number of our neurotic women.

Perineal and cervical tears, prolapse, malpositions, adhesions, tumors, etc., bring about catarrhal and congestive conditions; add to these a low-grade chronic infection and you have the clinical picture common in many cases. Remove the physical cause, not the entire anatomy. Treat the local infection locally and you get a cure. In childbearing women we may even bisect the uterus for the removal of small submucous fibroids, closing it again after the manner of Cesarean section.

There are several ways of treating complete uterine prolapse that possess all of the advantages without the disadvantages and extra risks imposed by hysterectomy. Naturally in malignant disease or tuberculosis nothing save removal wide of the mark is worth our consideration.

DISCUSSION.

Dr. Henry T. Byford, of Chicago.—We all agree with the author that conservatism is the tendency in surgery. We certainly must agree with him that no organ which does not present indications of disease should be removed. I wish to commend the conclusions of the author.

Dr. Rufus B. Hall, of Cincinnati.—In speaking of gonorrheal infection of the tubes, I did not quite catch whether the doctor proposed to patch the tubes and leave them, or whether he proposed to remove them. Like him, I believe in conservatism and in conserving the organs of generation in these cases, if possible. But what is conservatism? I doubt very much if we could apply the word conservatism to operations in those cases where it comes to opening the abdomen. If conservatism means saving tubes that have pus in them, I grant you that we should make an effort to save an ovary or both of them, but my experience leads me to believe that conservatism means the removal of tubes infected by gonorrhea, particularly when they contain pus, and not leave them, wash them out, and try to save them for the woman, so that she can become pregnant. If she has adhesions and a closed tube, and the case can be traced to infection from an abortion or puerperal sepsis, then there may be some question as to whether the tube should remain, but not if it is a *gonorrheal injection.* If the woman menstruates both tubes should be sacrificed, but if you can only save the piece of an ovary, it should be left in every case. If you can save a whole ovary, so much the better, and if you can save both ovaries that is better still.

Dr. Cannaday (closing).—I must have been unfortunate in not making my meaning clear, and in reply to Dr. Hall's remarks I wish to say that I did not wish to convey the

impression that I would leave a tube behind after opening the abdomen, or leave a tube that contained any pus, whether sterile or infected. What I meant to say was that if, after waiting a reasonable length of time, we found the tubes perfectly healthy, aside from adhesions or the ends being plugged, it was nothing but right in a case of that kind to do plastic work on the tube, that is, if the interior of the tube was practically normal.

PROSTATECTOMY.

By John B. Deaver, M.D.,
Philadelphia.

Prostatectomy, either partial or complete, is practically the only operation performed upon the prostate gland, except in acute suppurations. It would be hard to find another organ of the body whose functions and pathological conditions are so varied, yet in which the endeavors of the surgeon cover a field apparently so limited.

Yet we should not be deceived by this seeming limitation in the operative field. While the immediate procedure has always the same object—removal of all or a part of the organ—the indications for surgical intervention are many, the methods of performing it numerous, and the refinements of its technique vary almost with every individual operator of note.

The pathological processes of the prostate gland which may necessitate a prostatectomy can be divided into three classes:

1. Those in which enlargement or hypertrophy of the gland is the condition giving us the symptoms to be overcome.

2. Those in which the prostate is the seat of chronic disease, causing local symptoms often associated with grave physical conditions and in chronic gonorrheal prostatitis.

3. Those in which the prostate is the site of a malignant growth.

Simple hypertrophy of the prostate is the condition which most often demands the attention of the surgeon. When this condition exists it requires intervention, not because of any inherent danger or because of symptoms due to the prostatic condition *per se*, but because of the relation of the prostate to the bladder outlet.

The urethra passes through the prostate gland, which is composed chiefly of two lateral lobes—the true lobes of the prostate. At the neck of the bladder and in the floor of the prostatic urethra lies that mass of prostatic tissue which, when it becomes enlarged, gives rise to the erroneous idea of a median lobe. Granting, however, that there is no true middle lobe of the prostate, it may be convenient to term the enlargement of this portion an enlargement of the "middle lobe," and so it is often referred to by various authors, by some, indeed, in ignorance of its true pathological anatomy.

Hypertrophy of the prostate consists in an overgrowth of the adenomatous portion of the gland, with more or less accompanying increase in the fibrous connective tissue, and also at times with some increase in the muscular tissue. By some authors (Young) hypertrophy of the prostate is regarded as in most cases a true adenoma, while others (Watson) take a contrary view. However that may be, it will at once be seen that either the adenomatous or the fibrous proliferation may predominate. Should the adenomatous increase be the greater, the prostatic tissue becomes greater in size but less in density, *i. e.*, we have here the method of formation of the large, soft prostates met with. If the connective-tissue overgrowth predominates, we have formed those hypertrophied prostates which are small, firm, and densely adherent to the capsule.

Whatever be the process, there can be no doubt that any portion or any number of portions of the gland may become involved. Thus the lateral lobes may become larger without any marked median overgrowth, or the reverse may be true. In most instances, however, we have a coincident and fairly uniform enlargement of all of the prostatic tissues—in other words, a condition in which a partial prostatectomy would be a palliative and not a finally curative operation.

The distinction between carcinoma and ordinary hypertrophy of the prostate gland, while made with certainty by the microscopic examination of tissue removed, is clinically

not such an easy one. That is to say, while the disease is still localized to the prostate itself, the clinical symptoms which demand prostatectomy are precisely those which occur in hypertrophy, and to which I shall later refer in discussing the indications for the operation.

Chronic gonorrheal prostatitis has been the last important condition of the gland to be recognized. In former years it was practically never recognized, but later studies have shown that the prostate is often the cause of the persistence of gonococci in the genital tract in those cases of urethritis which are very refractory. Not alone this, but a chronic gonorrheal inflammation of the gland often gives rise to such profound neurasthenic and psychical phenomena that the local lesion becomes of secondary importance, while the whole life of the patient is overshadowed by the systemic results of a dormant lesion.

It is not my purpose here to enter upon the symptomatology of the various forms of prostatic disease except in so far as an understanding thereof is necessary in forming a summary of the indications for the operation of prostatectomy.

In simple hypertrophy the indication for prostatectomy is such an increase in any portion of the prostate that the normal voiding of urine is greatly interfered with. A prostate which enlarges, but does not prove an obstruction to the outflow of the bladder contents, is not *per se* dangerous, nor should it be in any way tampered with. We know that some grade of prostatic hypertrophy is, one might say, the rule in men over fifty-five years of age, yet in most of them there are never any evil effects therefrom. It may be thought by some that in an enlarged prostate the danger of malignant degeneration is such as to render prostatectomy advisable in many more instances than it is now performed, yet the comparative rarity of prostatic carcinoma and the frequency of prostatic hypertrophy do not lead me to take this view. I make the statement as to the *comparative* rarity of prostatic carcinoma

advisedly, although it must be recognized as being far more common than was thought before the routine microscopic study of prostates removed at operation was undertaken by various surgeons.

As to the degree of obstruction to which we should allow a case of hypertrophy of the prostate to go before counselling operation, opinions differ; yet as we know the process to be a progressive one, and as we know what a deleterious effect upon the patient's general health long-continued catheter life, even in the absence of bladder infection, has, it seems to me that operation should be much sooner considered by the physician and surgeon than it generally is. We must not lose sight of the fact that practically all cases of catheterism finally end in cystitis, and that this in many instances is but the starting point of an ascending infection which finally terminates fatally.

Those cases which do not require the use of a catheter suffer the inconvenience of frequent micturition, especially at night, and with the progress of the malady become unfitted for either work or the enjoyment of leisure. In well-marked cases the patients are a burden to themselves and to all about them, unable to keep themselves either clean or comfortable, and are certainly to be pitied.

Furthermore, we have a much greater chance of an operative recovery in a patient still in fair health than in one afflicted with cystitis or a retrograde kidney lesion and worn out by constant suffering.

I would choose, then, as the time of election for prostatectomy in cases of hypertrophy, that period in which the patient first begins to have distress, not delaying operation until all palliative and local measures have been tried and found wanting.

Doubtless in individual instances there may be considerations which might influence us to desist from operation. Severe heart or lung lesions might render anesthesia, even local, unadvisable or impossible. Age is not a bar to pros-

tatectomy, provided the general health of the patient is good. Some of my most brilliant results have been in men over seventy and eighty years of age.

In thus setting the indications for prostatectomy, it may not be amiss to remark upon one of the operations which came into the field before radical removal of the prostate was very common—namely, the Bottini operation.

I do not practise it any more. While in a very few instances it may be advisable, I consider it hazardous and unsatisfactory. The improvements in the technique of prostatectomy and the adaptation of various operations to the needs of individual patients have rendered the operation slightly, if at all, more dangerous than the Bottini, and there has never been any question concerning the relative value of the two methods of procedure among surgeons who have had experience with both.

As I have mentioned a short while ago, the clinical differentiation between carcinoma and hypertrophy of the prostate is far from being easy. Indeed, the vast majority of prostatic carcinomata are not diagnosticated before operation. A tentative diagnosis of a prostatic malignant growth is warranted when we have progressive prostatic enlargement in a man rather below the usual age for prostatic hypertrophy, and in whom the local symptoms are rather more grave than would seem to be warranted by the condition found upon examination. The most conspicuous symptoms are sacral and perineal pain. Should the prostate be extremely firm or very nodular, our suspicions would be still further strengthened. Perhaps the most reliable sign of a carcinomatous involvement of the prostate is an invasion toward the rectal mucosa. That is to say, in prostatic carcinomata we often note a failure of the rectal wall to slide freely over the prostate gland.

I have mentioned the presence of gonorrheal prostatitis of the chronic variety as being sometimes an indication for prostatectomy. There is no doubt that certain chronic cases of gonorrhea, in which the prostate is greatly involved, are

incurable as long as the prostate remains. While the large majority are curable by prostatic massage and other local measures, some are resistant to every form of treatment. It is, however, a difficult matter to decide when to advise a prostatectomy. Most men whom we see with this condition are not willing to pay such a price for the cure of their condition, involving, as it may and usually does, interference with normal sexual life. So that, while realizing that removal of the prostate is theoretically desirable, I believe it is often improper and impracticable to advise it.

Still another prostatic condition should be noted if we wish to take into consideration all the lesions demanding prostatectomy. This is tuberculosis of the prostate. The tuberculous involvement of the gland is rarely if ever an independent condition. It is practically always associated with tuberculosis of other portions of the genito-urinary tract, especially the epididymis and bladder. Before undertaking any operation whatever on a tuberculous prostate, we should be sure that the associated organs are not so involved that operation will do more harm than good.

A mention of tuberculosis brings to mind another very important point in the discussions of the indications for prostatectomy. It is this—the frequency with which tuberculous (and at times other) lesions of the genito-urinary tract higher up give us symptoms referable to the prostate. Tuberculous cystitis in its incipiency, and especially tuberculous nephritis and pyelitis, in which there is always infected and more or less irritating urine being voided, at times give symptoms almost entirely referred to the bladder trigone and the prostatic urethra. This is not to be wondered at, especially when we bear in mind the peculiar sensitiveness of the floor of the prostatic urethra and verumontanum. I have lately had occasion to observe a case in which a tuberculous kidney condition manifested itself primarily by symptoms referable entirely to the prostatic zone. A careful cystoscopic examination should always be made.

Granting, however, that a prostatectomy is for any reason considered advisable, what method shall we adopt for its performance?

We have the choice of two approaches to the prostate—the suprapubic route and the perineal. I have never used or found need for a combined suprapubic and perineal operation. Each mode of operation has had its strenuous advocates, yet no surgeon would be doing his patients justice in selecting the operation who does not use both methods—each in its proper place.

In simple hypertrophy I at times use the suprapubic method, at others the perineal. A careful selection of cases for each is just as important as the proper performance of the operation itself.

The suprapubic route has certainly very definite advantages. It offers a free exposure of the gland, a comparatively large working area, and few anatomical difficulties. It is therefore the ideal mode of approach for the removal of large prostates (soft adenomatous), and for these I always employ it. It is my uniform experience that the large adenomatous prostates may be far more advantageously removed by the suprapubic than by the perineal route. There is a larger working space, and we are not compelled to remove the gland piecemeal. We know also that, as a general rule, hemorrhage is more apt to occur after the removal of a large prostate, which leaves a deep bed with a great bleeding surface. If the bleeding is excessive it is very easily controlled by packing, as will be spoken of farther on.

My technique for the suprapubic prostatectomy is as follows: After preparing and anesthetizing the patient in the usual way, a catheter is introduced into the bladder, and whatever urine is present is drawn off. The bladder is then washed out with a boric acid solution until the fluid returns clear. About four ounces of boric acid or normal salt solution is then introduced and the catheter clamped to prevent its escape. The patient is then placed in the Trendelenburg

position. This causes the viscera to gravitate away from the pelvis and bladder.

The fluid contained in the bladder is sufficient to distend it enough to raise the peritoneum to such an extent that we have in the median line a certain area of the bladder not covered by it. In other words, the bladder is opened extraperitoneally. Introducing narrow retractors, the fundus of the bladder is well exposed and the catheter fills the urethral orifice. A small incision is then made on either side of or around the orifice of the urethra, and by means of the ungloved finger the prostate is shelled out, the finger going between the two layers of its capsule, or rather just outside of its true capsule. While this is being done the surgeon supports the prostate by a finger of the other hand placed in the rectum, and so furnishes also a guide to prevent tearing into the rectum by the decapsulating finger. It may not be possible to remove the prostate entire, but, as a rule, we can do so. At times we are able to preserve the prostatic urethra, at others not. I have never noticed any difference in results whether this was done or not, with the exception that I think stricture is more likely to occur when the prostatic urethra has been removed. The bed of the prostate will always show some slight oozing, and often it is possible to secure hemostasis by the use of a hot douche of saline or sterile water. When, however, there is the least doubt concerning the bleeding, I pack the bed of the prostate with a strip of gauze and when possible place a purse-string suture of catgut in the bladder mucosa surrounding the opening.

We have now to complete the operation by taking care of the bladder wound and supplying an efficient means of drainage for the urine. The bladder may be stitched with catgut at either extremity of the wound, if this be very large. Into the bladder I place a large, firm rubber tube of at least three-quarters of an inch in diameter, open at the bottom, and with the sides also fenestrated. It is introduced just a little way into the bladder, so that drainage is not interfered with, and

it is held in place by one stitch of catgut passed through the skin, superficial fascia, and sheath of the rectus. The fascial layers and skin may be stitched with catgut, with one or two through-and-through sutures which pass through all the layers of the wound, one of which goes through the walls of the bladder and so serves to hold the bladder up. Unless this deep suture is put in, the bladder may prolapse away from the tube and fail to drain properly.

The operation being completed, the patient is removed to bed and the suprapubic tube is connected with a rubber outlet tube running to a receptacle at the side of the bed.

The operation as I have outlined it is in all its essentials the one popularized, but not originated, by Mr. Freyer, of London. I am accustomed to say to my students that the postoperative treatment should begin before operation. That is, we should see that the patient's general condition is as good as it is possible for us to have it, and especially that his kidneys are functionating well. It is to be expected that in men past middle age with a tendency to arteriosclerosis some renal deficiency should be present, and it has been my experience that after these operations scantiness of urine and uremia are the complications that we most often are compelled to meet.

On the table the patient should be placed on a hot water bed or very warmly wrapped in blankets, and should be protected, both in the operating room and in transit to and from it, from every possibility of a draft. Postoperative pneumonia is not an uncommon occurrence in these cases, and is often given its start by the soaking and drainage of urine and fluids about the bedclothes of the patient.

Should gauze have been placed in the prostatic bed to prevent hemorrhage, it is best to leave it in four or five days, so that in its removal we do not run the risk of secondary hemorrhage, yet we must not allow our caution in this respect to go too far. If the gauze be left a very long time, it has a tendency to seriously retard the healing of the supra-

pubic wound and to contribute to the formation of a permanent fistula. The drainage tube should be left in for from three to five days, and its fairly early removal is called for also to hasten healing of the wound.

After removal of the suprapubic tube the urine is left to drain freely into gauze pads, while every effort is made to keep the patient as clean as possible. I do not leave a urethral catheter in these cases, as it performs no useful function, and may, and does, seriously interfere with the patient's comfort. I do, however, pass a sound at the expiration of about eight days after operation, and at least once a week thereafter until healing is complete. Stricture of the urethra after suprapubic prostatectomy is most rare, but is not unknown and should be guarded against.

Permanent fistula after the suprapubic operation is in my practice unknown. The wound heals at times very rapidly, and, as a rule, the patients should be well in from four to six weeks. Occasionally, by reason of the metabolism of the patient and the constant exposure of the bladder, there is marked tendency to the precipitation of phosphites, which are deposited around the walls of the fistula and cause delay in healing. The condition is a difficult one to treat, but may be improved by the use of large quantities of water internally, regulation of diet, and the administration of such drugs as urotropin and sodium benzoate.

The drinking of water is to be advised regardless of this condition. It serves to keep up the kidney function and to flush out the organs, and, as I have already mentioned, the use of diuretics may at times be needed, as the kidney function is the one most difficult to keep at par after these operations. Both hypodermoclysis and proctoclysis are in some instances invaluable.

The patient should be fed liberally after the first few days, should be encouraged to sit up and gotten out of bed as soon as possible, and instructed to take advantage of any chance to pass even a few drops of urine by the urethral route.

There is but one serious immediate postoperative complication with which we may have to deal after a suprapubic prostatectomy—hemorrhage. It is exceedingly rare if the technique of the operation has been carried out carefully and with attention to detail, yet it does at times occur. The treatment consists first in the local application of hot solutions to the bladder by irrigation, and rest for the patient. At times the use of ice bags externally over the bladder region seems to have a hemostatic action. Should these simple measures fail to stop the bleeding or reduce it to a slight oozing, we must reopen the bladder and firmly pack the prostatic bed.

A perineal prostatectomy I consider the operation of choice in all small and fibrous prostates, especially those situated low down in the perineum. There are several reasons for this choice of approach. In the first place, we must traverse much less space to reach the gland itself. The anatomy is somewhat complex, but when once mastered it presents, even when pathologically altered, no very grave difficulties. If the prostate be very adherent to its outer capsule, removal by the suprapubic method may be impossible, whereas by the perineal it may be accomplished.

Carcinomatous prostates should also be removed perineally. Their firm attachment to the rectal wall has already been noted, and the same reasons for this choice of operation hold good as in the small firm prostates. The perineal route also offers us the only chance of performing a radical operation for cancer of the prostate, such as the one advised by Young.

Gonorrheal, tuberculous, and sarcomatous prostates should also be removed perineally. In the first two the possible bladder infection by the two wounds in the wall of this viscus during the suprapubic procedure offers us sufficient ground for not adopting it.

The technique which I follow is that of Young. I consider it preferable to the methods of perineal prostatectomy advocated by Watson and others, because it gives a much

better exposure of the bladder, especially of its posterior surface, and because it enables the use of the senses of sight and touch, and not merely the latter.

For this operation the patient is put in a high lithotomy position. An inverted V incision is made in the perineum, the fat pushed back, and after the insertion of a two-branched retractor the central tendon is divided close to the bulb and the membranous urethra exposed. This is then opened upon a guide, and the edges of the urethra being held open, a special tractor is introduced into the bladder and opened. The prostate is now firmly drawn down and the posterior surface exposed. The rectum is held out of the way by a narrow retractor and the prostate is now fully exposed. By means of lateral incisions to either side of the urethra, it is now possible by means of blunt dissection to free and remove the lateral lobes of the prostate, and at the same time allow the urethra and ejaculatory ducts to remain uninjured. It is in that latter feature that Young's technique is so much superior to other perineal prostatectomy methods, such as Proust's, and although the preservation of the ducts is not always desirable or possible, they certainly do no harm if allowed to occupy their normal position. An enlarged median lobe can, by a little manipulation, be brought out through one or other of the lateral openings without in any way injuring the ejaculatory ducts, except in particularly unfavorable cases.

When the operation is completed the lateral cavities are packed lightly with gauze. Two drainage tubes are placed side by side into the bladder through one limb of the incision, and the other is closed entirely. These two tubes serve for the purpose of continuous irrigation of the bladder with saline solution when this is considered necessary to prevent blocking, or even as a routine measure. It is my practice not to take out the gauze until the third or fourth day, the tubes being left in a day or two longer if they will remain. Sounds are passed at intervals of about a week, starting ten days after the operation.

Hemorrhage after a properly performed perineal operation is rare, but when it does occur prompt and thorough packing is the only method at our command worthy of consideration.

Fistulæ are rather more common after the perineal than after the suprapubic operation, and the chances of an operative cure are even less. On the other hand, they are probably less objectionable to the patient than the suprapubic ones, though the existence of either variety of fistulæ is enough to produce much discomfort to the sufferer.

The technique of both these operations I have sometimes varied slightly to suit the requirements of individual cases, but I endeavor in either one to keep as close as possible to typical procedure. Within the last few years Young has described a radical prostatectomy for carcinoma. His method involves removal of the gland, resection of the bladder wall in proximity to it, and transplantation of the urethra, and he has reported two at least temporarily successful cases out of four operated upon. I myself have never performed this operation. While in the hands of an experienced man it may be at times successful, it is too grave and complicated a procedure ever to come into general use. Its mortality and difficulty seem to me to more than balance its advantages.

From the description of the cases on which this method of prostatectomy is performed it is evident that it is an operation calling for considerable skill and care to be successful. Our cases must be properly selected and thoroughly prepared. The operation must be painstaking and exact, and the after-treatment carried out with continual vigilance. Yet when we consider the disadvantages under which it is often performed, we can well say that a prostatectomy properly done is a satisfactory operation, usually entirely successful in relieving the patient and prolonging his life.

BILATERAL POLYCYSTIC DEGENERATION OF THE KIDNEYS.

By J. Wesley Bovée, M.D.,
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The title of this paper should indicate a degeneration of the kidneys that is quite rare and equally fatal. The first case I find recorded in the library of the Surgeon-General's office, according to the index catalogue thereof, was reported in London in 1827, by Jeffreys.

Synonyms. Various names have been applied to this condition, Rayer gave it the name of "cystic degeneration of the kidney;" Cruveilhier, "cystic metamorphosis, or transformation of the kidneys," while others have given it the titles, "cystic disease," "congeries of renal cysts," "conglomerate cysts," and "large polycystic kidney."

Definition. The condition under consideration is not to be confounded with the cystic condition often seen in chronic interstitial nephritis and is also to be distinguished from other cyst formations of this organ often occurring singly or in a small number, having perhaps prodigious proportions and usually arising from obstruction of a ureter or kidney calices and which are not commonly bilateral. This form of disease, *per contra*, is usually bilateral though often developed unevenly in the two kidneys. Usually one kidney shows marked enlargement while palpation and even inspection, as well as analysis of separated urines may lead to the opinion that little or no involvement of the fellow kidney exists.

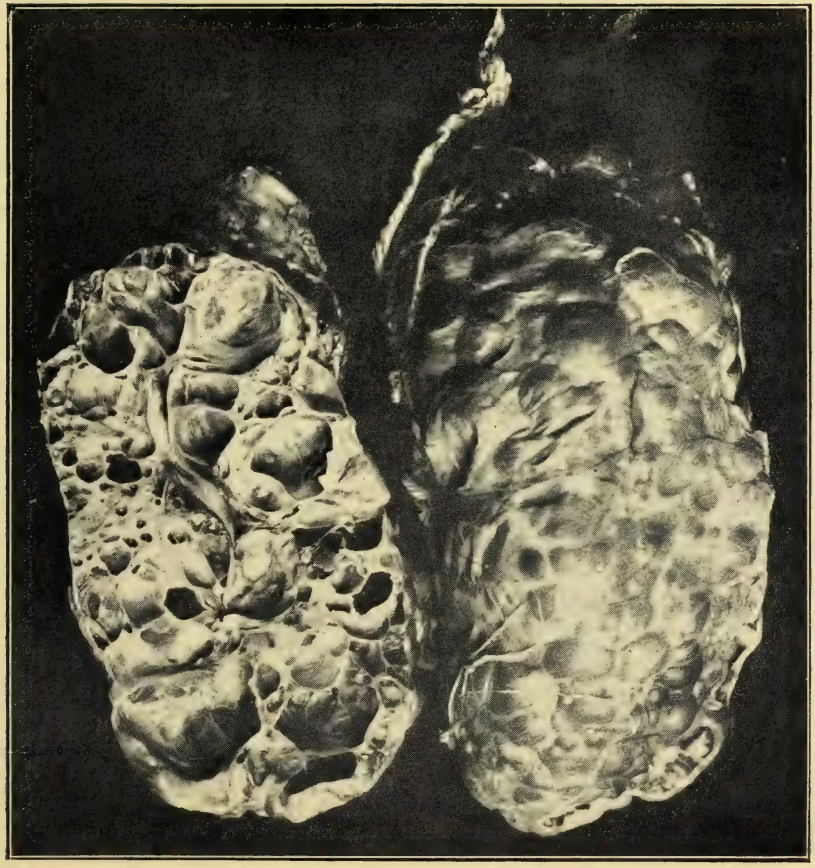
Many times has a large polycystic kidney been extirpated under the misapprehension that the fellow was healthy and competent and a fatal result from uremia followed in a few days or weeks. Nor is the kidney on one or both sides always materially enlarged, though notable enlargement is usual. Dickinson studied 26 cases, finding but one kidney free of it. Lejars failed to find a normal kidney in 62 cases and Ritchie found that in 82 cases he had studied postmortem the condition was unilateral in but two. Henry Morris operated on 7 cases in 4 of which a normal kidney was found on the opposite side. The characteristics of the bilateral polycystic kidney, then, are an organ practically retaining its shape, but being changed in size to any dimensions up to ten or twelve times the normal ones, degenerated into a mass composed of cysts numbering hundreds or thousands, that vary in size from microscopic measurements to those having capacity for several quarts of fluid, and with contents quite characteristic, as will be mentioned in considering the pathology of the condition.

The history of bilateral polycystic degeneration of the kidneys extends to the case reported by Jeffreys in 1827 and the comparatively small amount of literature on the subject is quite disappointing. Lejars collected 68 cases and several have since been reported. Bunting, in 1900, collected 200 cases. I believe a conservative estimate of the number of reported cases would be less than 300. A question that has not been settled by clinicians and pathologists is whether the large polycystic kidney weighing one to sixteen pounds (Hare's case) is the same as the congenital polycystic kidney found before and a short time after birth.

I have observed the following case: Mrs. H. B., aged twenty-nine years, was admitted to my service in Columbia Hospital, July 17, 1908, on account of a general anemic condition accompanied by a cough and agalactia. During the three days' residence in the hospital not more than four ounces of urine containing pus was obtained by catheterization. She exhibited twitching of the extremities, which rapidly developed

into marked tremor, sank into uremic coma, and died on the 20th inst. Sixteen days previously she had given birth to a child and the labor was reported normal.

Dr. John S. Neate, assistant pathologist of the hospital and anatomist to the Army Medical Museum, has carefully studied the specimens from ten cases, including my own, his report on the autopsy in my case is as follows: The body showed only a moderate degree of emaciation, the skin somewhat jaundiced and rigor mortis present. On opening the abdomen the peritoneum and intestines were found to be normal, but occupying each outer third of the cavity from the under surfaces of the liver and spleen superiorly down to or below the crests of the ilia were found enlarged cystic kidneys. The weight of the kidneys taken together was 80 ounces, length, 8 inches; width, 4 inches; thickness, about 4 inches, both being symmetrically enlarged and about equal in size. The cysts varying in size from that of a pea to that of a walnut, were seen through the peritoneal covering filled in most cases with a straw-colored fluid and in others with dark brown or reddish coagula. The ureters were traced from the bladder to the pelvis and were normal in size. On section the left ureter oozed a few drops of pus. The bladder contained a few ounces of pale fluid containing pus threads, but there was no inflammation of the bladder wall and the ureteral orifices were normal. The kidneys exhibited no adhesions to the neighboring intestines and the bloodvessels appeared to be in their normal relations, but larger than usual. On section several ounces of fluid escaped and the kidney was found to be a mass of closely packed cysts with thin fibrous septa and little or no normal kidney tissue visible. Some few of the cysts contained thick pus. The liver was pale, mottled with yellowish areas and rather bloodless (as, indeed, were all the organs), but contained no cysts. The spleen was slightly enlarged and firm. The contents of the thorax was normal, except the heart, which was slightly enlarged. The uterus and appendages were in good condition. Cultures made from the pus in the



Photograph of bilateral polycystic kidneys.

Photomicrograph of a section of bilateral polycystic kidney. × 150.

kidney gave capsulated diplococci and common pyogenic organisms.

Anatomical Diagnosis. Bilateral congenital cystic disease of the kidneys with secondary infection. On removal to the laboratory the organs were submitted to closer examination, and it was found that a large-sized probe could be passed with ease through the ureters into the pelvis. The plainly visible cysts were counted as they appeared on the convex surfaces of each half of the kidneys and were found to average two hundred and fifty, while the cut surfaces gave twenty to thirty less in number. The infundibula were explored and several cysts were found, probably of recent origin, which opened therein, and distributed around these sinuses were the small irregular triangular areas not apparently occupied by cysts and containing the remnants of the kidney tissue proper. A liberal estimate of the solid tissue containing glomeruli and convoluted tubules in anything like normal arrangement taken altogether in one of these kidneys would not exceed one cubic inch of normal kidney cortex. While the larger cysts are about one inch in diameter and range downward from marble to pinhead and finally microscopic size, there is a certain uniformity in size and distribution which is suggestive. The smaller cysts occupy the triangular areas where the septa join, and between these again microscopic cysts were subsequently found. This economy in distribution, taken together with the fact that the sound tissue is in immediate relation with the pelvis and that all semblance of pyramids is obliterated, leads one to the conclusion that the process of cyst formation is gradual, continuous, and proceeds from the cortex inward, the area around the infundibula being the last to succumb. From the extreme thinness of the walls of the larger cysts one wonders that they have not coalesced to form a few large ones, and the inference is inevitable that the internal pressure must have been low or very equally counterbalanced by external pressure.

Dr. W. M. Gray microscopist of the Army Medical

Museum, made the microscopic sections and the photographs, as well as the photomicrographs accompanying this report, which latter is as follows: The organs are made up of a soft spongy mass consisting of innumerable cysts varying in size from those of microscopic dimensions to those of the size of an English walnut. These cysts are filled with a semijelly-like albuminous fluid and urine; the walls of the cysts have a framework of rather dense fibrous connective tissue. The septa dividing the cysts one from another is composed of this dense fibrous tissue, with an occasional aggregation of small round cells. Running through the septa are numerous tubules and glomeruli; the majority of which are enormously dilated and there is every indication that the cysts have developed both from the tubules and the glomeruli. Many of the tubules and also the smaller cysts are lined by a very pronounced columnar epithelium, which is quite distinct from the epithelium found in normal kidney tubules. The photomicrograph shows one of the dilated glomeruli and a small cyst, the latter partly filled by the jelly-like albuminous material. This cyst probobly originated from a tubule. The photomicrograph also shows other smaller dilated tubules surrounded by dense connective tissue.

Microscopic examination of these cysts and the interstices disposes one to classify them as primary and secondary; those which obviously have existed for some time and those of recent development. There is no sharp line of transition from one type to the other, but in view of the probable origin and effect of these cysts, it is helpful to an appreciation of the pathology and etiology of a condition all too obscure at the best. The oldest cysts have quite dense fibrous walls staining deeply with eosin, sometimes devoid of, or showing only vestiges of altered epithelial lining, and the adjacent tissue is rich in connective tissue, permeated by few tubules and these atrophied. The cysts of more recent formation contain cell detritus and fragmented nuclei and their walls contain little or no fibrous tissue. The neighboring tubules, chiefly

of the collecting type, are flattened or pushed to one side in the process of their development, and the epithelium lining both cysts and tubules is of the low cubical order, practically identical in each of them. The intercystic tissue is relatively rich in tubules and contains but little connective tissue. The oldest cysts having dense fibrous walls are by no means the largest. In this kidney one is impressed by the persistence of straight tubules in the septa and the epithelium of the low cubical type, very regularly arranged with large nuclei staining intensely with hematoxylin. This type of epithelium is found replacing that of the convoluted tubules and in Bowman's capsules. In the few convoluted tubules and tufts which have escaped obliteration the transition is beautifully shown. In some areas the characteristic epithelium of the convoluted tubules has been shed in masses into the lumina and beneath it a new layer of the cubical type has formed. This type of cell, while it resembles somewhat those lining the ascending portion of the loops of Henle, is probably a reversion to the embryonic type. The few small islands of cyst-free tissue in the neighborhood of the calyces is rich in connective tissue and resembles the condition of chronic interstitial nephritis, except that there is a healthier appearance to the epithelium and an absence of change in the walls of the bloodvessels. The intercystic tissue is everywhere surprisingly vascular. Distended capillaries or sinuses exceeding six or seven times the normal size are found in close relation with tubules or penetrating islands of fibrous tissue; their walls consisting of a layer of flattened endothelial cells only and sometimes seven or eight of them aggregated so closely that their walls are in contact. Similar dilated spaces lined with endothelium, but containing no blood cells, were observed and interpreted as dilated lymph channels. The reason for an increased blood supply to such a mere shell of an organ, which consisted so largely of fibrous tissue, is hard to explain. The increase of connective tissue may account for the dilatation and contortion of the capillaries and lymph spaces described

above and the increased blood pressure necessary to fill these sinuses and to preserve them from obliteration by the ever encroaching fibrous tissue may, in part, explain the cardiac hypertrophy which accompanies this condition. A few small interstitial hemorrhages readily account for the color in the coagula found in some of the cysts and from these in a similar case Sollman, by chemical analysis obtained the derivatives of hemoglobin, but no urea. The liver exhibited a moderate amount of fatty change, chiefly located in the peripheries of the lobules. The bile ducts appeared to be reduplicated and some of them were distended and, in general, were surrounded by more than the usual amount of connective tissue, but no cysts were found. Adding to the complexity of the histological picture are the evidences of the very recent bacterial infection which contributed to the fatal termination and are so well known as to require no description here.

Pathological Anatomy. In the polycystic kidney the whole structure of the organ seems to be affected and the glomeruli are oftentimes found to be practically all destroyed. In my case, studied by Neate, an estimate of the functionating kidney tissue was made and was thought to be not in excess of one cubic inch in each kidney. It is undoubtedly the uniformity of the process throughout the kidney that preserves the shape of the organ. Beck counted more than one hundred cysts, on the surface of a kidney. On the surface of one of the kidneys in my case two hundred and fifty cysts were counted and on the cut surface still many more were found. Sometimes the size of the organ is increased remarkably. In my case the kidneys weighed 80 ounces and each measured $8\frac{1}{4}$ x $4\frac{1}{4}$ x 4 inches. Danforth found the kidneys in his case weighed respectively $5\frac{1}{2}$ and 6 pounds. In Hare's specimens the left kidney weighed 16 pounds and was $15\frac{1}{4}$ inches in length, the right being double its normal size. The cysts occupying both the medullary and cortical substance alike project to the surfaces and push out the capsule as nodules. The cysts may be enormous and contain half a pint of fluid,

which may vary from a very thin watery fluid to a thick and gummous one or even nearly pure blood. As will be noted the structure of the kidney is almost entirely transformed, there being left in my case an estimated cubic inch of renal functionating tissue in each one of the kidneys and it was in immediate relation to the pelvis. The kidney seems to be a mass of cysts separated by connective tissue. The oldest cysts have quite dense fibrous walls and show absence or only vestiges of a changed epithelial lining and the adjacent framework is largely connective tissue containing a few atrophied tubules. The newer cysts contain debris recognizable as broken down cells, fragmented nuceli and walls containing but little or no fibrous tissue. The neighboring tubules, chiefly of the collecting type, are flattened or pushed to one side in the process of their development and the epithelium lining both the cysts and the adjacent tubules is of the low cubical order and practically identical. The intercystic tissue is relatively rich in tubules and contains but little connective tissue. The largest of the old cysts do not invariably have the thickest walls. The normal epithelium of the convoluted tubules and in Bowman's capsules is seen to be replaced by the low cuboidal epithelium mentioned. The few small islands of cyst-free tissue adjacent to the calices are rich in connective tissue resembling chronic interstitial nephritis, except the epithelium has an appearance nearer normal and absence of degenerative change in the bloodvessel walls. Marked vascularity of the kidney framework is everywhere apparent and hypertrophy of the left heart is quite commonly observed as a complication. The distended capillaries or sinuses everywhere observable have a layer of flattened endothelial cells only and sometimes seven or eight of these vessels are found in contact. Large spaces lined with endothelium, but containing no blood cells, are here noted and are probably lymph spaces. Numerous cases of this condition associated with cysts of the liver have been reported. Lejars found this complication was present in 17 of the 62 cases he tabu-

lated. Ritchie found that in 82 cases the liver was cystic in 21, in one of which the thyroid, one the uterus, and one the ovary, was also cystic. Still's statistics would indicate that cystic degeneration of the liver rarely complicates congenital cystic kidney, for in 35 cases of cystic disease of the liver associated with cystic kidneys only 3 occurred in infancy. Cysts of the spleen have been observed as a complication. Henry Morris mentions the co-existence of talipes, cleft palate and imperforate anus as well as the absence of the anus, rectum, urethra, and external genitals. He also notes the absence of the renal pelvis and the ureter. Newman found the heart hypertrophied in 60 per cent. of the 105 cases he tabulated and the arteries atheromatous in one-fourth as many. He also observed malformations of the aortic valves and of the septum of the ventricle.

Character of the Contents of the Cysts. The contents of the cysts vary greatly in different cases, and in different parts in the same case. The color is quite commonly straw, then serous or limpid. But it may be yellowish, purplish or, if hemorrhage has occurred, dark red. It may also be thick, viscid, tubrid, or colloid. The contents of some have been found to resemble pea soup, to be caseous and practically solid in other instances. Pus has been detected as a constituent of the contents. Usually the reaction is alkaline, but it may be acid or neutral. A large proportion of albumen is usually present with a small amount of urea, triple phosphates, cholesterin, uric acid, epithelium, fat, blood corpuscles and rarely leucin. That the polycystic kidney is always a congenital condition, as believed by Henry Morris, I cannot accept, though believing it to be so with certain exceptions. One cannot ignore, or consider entirely disproven, the various theories that have been offered as to the origin of this condition. Of these there are four principal ones, viz.:

1. Persistent germinal rudiments—that is, fetal inclusions. 2. The obstruction theory which insists the development of the cysts is a sequel to a renal sclerosis that constricts the

tubules or obliterates the papillæ. 3. That there is a colloid or fatty change and that the cysts are centres of the change. 4. The neoplasmic theory. Were the first theory sufficient to cover all cases the congenital influence would be at once unqualifiedly recognized, but with the proof of cirrhosis as a cause great difficulty at once arises in accepting the inflammatory process as being always antenatal. In my judgment a very large proportion of the cases are due to the first named theory. That the Wolffian body forms the ureter and calyces and the metanephric blastema the urine-forming part of the kidney is amply demonstrated by Kölliker and other embryologists. That a failure of fusion of these two structures occurs is readily acceptable in the light of developmental anomalies so frequnetly observed in other parts of the human body. Moreover, such anomalies are frequently co-existing with the bilateral polycystic kidney. One can also understand how the anomaly may rarely exist on one side only. I have already stated how rarely this occurs. These facts are well known, viz.: That it frequently is found at childbirth, and as a cause of dystocia, as reported by Morse and others, and frequently in the same family, a matter of common observation. It has very frequently been noticed that several children in a family will be victims of this disease. Beck found it in two sisters, Lund, in a man whose mother was a victim of it. Virchow reported cases in which 4 out of 6 children in the family were affected. Sanger also reports having observed families in which the first, fourth, seventh, tenth, and thirteenth child had bilateral congenital cystic disaese of the kidney, the other children being normal. Osler has written on this subject as have numerous others, but to me it appears that usually the disease arises from an inherited tendency toward faulty development, which frequently is not limited to the kidney. That this defective development appears in other parts of the urinary system we have only to mention exstrophy of the bladder with its frequent accompaniment of epispadias, etc. Nevertheless, one has to admit that antenatal cirrhosis being

extremely rare and the presence of it, perhaps in a modified form, in the adult cases the conclusion is inevitable that the cirrhosis is the cause of the illness. Again knowing the proneness of the kidney to contain adrenal "rests" and hypernephroma develop in consequence, to me it seems highly probable that this form of tumor, while not easily diagnosticated, can form in the kidney from degeneration of such rests. The obstruction theory is plausible, but not always attractive. Some cases clearly develop in adult life from obstruction of a ureter or infundibulum by a calculus.

Etiology. *Age* does not seem to offer much influence in the causation of this disease as it has been found at all ages from intra-uterine life to eighty-eight years. Ritchie gives the ages of seventy-five cases in his table and the average is 45.3 years and the oldest was eighty-eight years, while Jepson operated on a child four months and fourteen days after birth, which is probably the youngest recorded patient to survive nephrectomy. The number of cases that have been noted at birth is large.

Sex, probably has no greater influence. It is unfortunate that the statistics of Ritchie, Lejars, and Still are at great variance. Probably neither sex have a predilection for the formation of congeries of renal cysts. Malaria was in a few instances supposed to have an etiological relation. There can be little doubt that a lack of development of the kidney is the principal cause. This takes the form of a failure of coalescences between the branch of the Wolffian duct that changes into the ureter, pelvis and calices of the organ and uriniferous tubules that are formed from the nephrogenic structures in juxtaposition. Obstruction of the ureter or other part of the drainage part of the urinary tract is quite possible, as is either interstitial or parenchymatous nephritis, the one acting by constricting the tubules and the other by blocking them with desquamated epithelium. Nor can the neoplasmic origin be entirely ignored.

SYMPTOMATOLOGY. Either the onset of the disease is without symptoms other than the presence of a tumor on either side (rarely on only one) increasing in size or they are referable to other organs. In 10 per cent. of the cases no symptoms at any time point to a renal lesion and the diagnosis is made from a necropsy. Rarely has uremia been the first evidence of renal disease, and it has always been promptly followed by coma and death. While dropsical effusions do not occur, the symptoms closely resemble a chronic nephritis. Crises simulating calculous colic occur and not always are such calculi quiescent. There is commonly localized pain and a feeling of fulness in the region of the kidney. The urine behaves much as in chronic nephritis and frequently contains blood as mentioned earlier in this paper; the tumor may become remarkably large, Hare finding it weighing 16 pounds. Disorders of the nervous system, as well as the gastro-intestinal or the respiratory and circulatory systems are not uncommon.

DIAGNOSIS. The diagnosis is very commonly not made before death. About 10 per cent. of the patients have no symptoms referable to the kidneys and in a larger per cent. of cases uremia was followed rapidly by coma and death. One-fourth of them present a tumor of the kidney and fully one-half complain of symptoms of chronic nephritis. Lejars found in his series of 62 cases the diagnosis before death was made in but 5. Morris says: "When, with a sallow complexion, hypertrophy of the heart and increased arterial tension, the urinary symptoms mentioned and a tumor in each of the renal regions, or a tumor in one and an increased fulness in the other, are found, the diagnosis of 'large cystic kidney' is pretty clearly indicated." Osler believes hematuria, with characteristics of the urine present, resembling those of chronic interstitial nephritis, together with the presence of bilateral tumors in the flanks and the cardiovascular changes present, should justify the diagnosis of bilateral polycystic kidney. I am prepared to accept this statement, but in the

few cases in which the disease is unilateral, or in which on one side practically no tumor is present the diagnosis is by no means certain. Should developmental abnormalities exist in other portions of the body the presumption of polycystic kidney is greater, and if the patient be an infant the probability is greatly enhanced.

Prognosis. The duration of bilateral polycystic kidney is markedly variable, inasmuch as it causes death in infancy and has been encountered as late in life as eighty-eight years. If these aged subjects have the disease at birth then it is at once understood that the progress is by no means regular. Whether, like adrenal "rests" in the kidney, this degeneration may be dormant for many years and then develop rapidly, is unsettled, but presumably such process does occur. It may lie dormant, apparently during a natural lifetime death occurring from some independent condition. Or, it may rapidly progress, cutting down the patient with but a few days or hours of severe illness, as does chronic interstitial nephritis. In about half the deaths from this disease uremia, coma, or convulsions had preceded. Several died from pulmonary or cardiac complications. Cerebral hemorrhage is listed as a forerunner of the fatality and many have died after removal of one kidney.

Treatment. Notwithstanding the deprecating reference made by Osler ("In these operating days, etc.") to modern surgery, neither he nor others have any non-surgical treatment of value to suggest. While a few cases of polycystic kidney apparently have been cured by nephrectomy, Henry Morris, who has written a very fine treatise on "Large Polycystic Kidney," in his excellent *Surgical Diseases of the Kidney and Ureter*, says of the five cases he subjected to operation: "Unsatisfactory as these results are, yet two out of the five patients have had their lives prolonged and in complete comfort by nephrectomy, in one case for nearly seven years and in the other for three years. In the third case of unilateral disease the patient might have recovered and survived for years

like the other two had he not, so to speak, died an accidental death by suffocation while vomiting." About 40 cases of nephrectomy for polycystic kidney with about 20 fatal results are to be found in literature.

It is quite evident that if surgery has naught to offer for the relief of this condition we have but to remain quiet and allow death to claim its victims. It is also perfectly clear to my mind that in the bilateral character of the disease, and nearly always it is bilateral, surgery has little to offer. Beck proposed to incise the cysts, injecting into each small one a drop of saturated solution of iodoform in ether and excision of the large ones. I am not prepared to speak authoritatively, but the difficulty of putting a drop of anything into each of the thousands of cysts in one such kidney or even puncturing each is at once apparent, nor could reliance be placed upon the efficacy of such a measure to prevent refilling of such cysts, as complete obliteration would seem a necessity.

It is quite evident that in those cases successfully subjected to operation and have lived comfortably for some years—perhaps are yet living—the fellow kidney was normal, for in several subjected to nephrectomy, prospects were bright for a few days and then uremia supervened and continued until death shortly ensued. Of this character was Beck's case in which the fellow kidney was small, but rapidly increased in size until death occurred on the eleventh day after operation, Haynes lost his patient two weeks after operation. And here again one is tempted to suggest the probable cause in these successful cases was an obstruction of local character and removable by operation. Certainly no case is recorded of continued improvement in health after any operation on one side when the disease co-existed, to an extent, no matter how slight, on the other side.

Others have operated removing a large polycystic kidney and a rapidly supervening autopsy revealed the opposite kidney in a similar condition. In fact, in one of the ten cases studied by Neate (Kelly's), the right kidney, weighing 21½

ounces, was removed before death and the left, weighing 23 ounces, by autopsy. The fact that the disease is nearly always bilateral, and that it is uncommon to find the disease advanced equally on both sides, is very important in considering the advisability of nephrectomy. Another important desideratum is that the presence of the tumor or of polycystic kidney is not the fountain of danger necessarily, but, instead, it is the crippling of the excretory work of the two kidneys. Unlike ordinary or malignant renal tumors that are originally unilateral and in which the fellow kidney is usually normal, we here have to deal with a kidney affection practically always double. It seems but logical, then, that our first thought in treatment should be conservation of renal functional structure. In my case Neate estimated that but one-fifteenth of the functionating structure of either kidney remained. It was plain, therefore, as the patient died of deficiency of renal excretion, that it would appear this reduction was too great to be consistent with life. It is then plain that more than two-fifteenths of the functional ability of one kidney must be retained. Just how much more has not been ascertained. But making due allowance for the tendency to rapid progress in the kidney remaining after nephrectomy, it would seem very hazardous to remove a kidney when the other one offers the slightest evidence of involvement.

To sum up then I would say the treatment is non-surgical, except in two conditions: (1) When the disease is unilateral or reasonably concluded to be so, and (2) when the cysts are so large as to be burdensome in anyway. In the former, incision, or possibly nephrectomy, is advisable. If the ureter or other part of the purely waste-bearing portion of the corresponding half of the urinary tract be hopelessly obstructed beyond a period of six weeks the function of the corresponding kidney will be permanently suspended and nephrectomy is preferable to incision or multiple incisions. But if urine is found to be pouring from both ureters then nephrectomy should not be done, except in the very exceptional unilateral

polycystic kidney. Were it at all apparent that the presence of the disease in one kidney had a tendency to stimulation of its development in the other kidney, I would feel less positive in this matter. In the second condition puncture or incision seems applicable, whether the disease be unilateral or bilateral. If cystoscopy reveals both ureters to be functionating, then, even though but one kidney be involved, nephrectomy should not be performed, except in the rarest circumstances—such as hemorrhage limited to the affected side.

PRIMARY BLADDER SUTURE, WITH ESPECIAL REFERENCE TO SUPRAPUBIC CYSTOTOMY.

By Louis Frank, M.D.,
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The history of the surgical treatment of stone in the bladder is a reflection of the evolution of surgery. It also illustrates very aptly that there is little new in operative surgery, and that with the application of the new principles of asepsis and avoidance of infection many and valuable suggestions and practices of forgotten days may be put into execution without the fear of a deterring mortality which practically forbade them and made resort to cruder methods a necessity and not a choice.

This, as also the title of my paper, will indicate that I have nothing new to offer nor any claim of priority to submit. I wish only to add my voice in the establishment of a sound surgical practice, and by your discussion aid in lifting bladder surgery and the treatment of vesical calculus out of the darkness which has surrounded it since the time of the early Christian era.

Perineal cystotomy for calculus disease, as in fact all perineal operations for relief of bladder disturbances either by stone, by newgrowths, or prostatic enlargement, are relics of barbarism, and relics which we have not improved upon since in our possession. Celsus' description and technique for perineal section would answer today were one to judge by the current text-books. I would submit that in this day of clean surgery and anatomical knowledge the approach par excel-

lence for intravesical surgery or for prostatic surgery is suprapubically. If drainage is desired, it has been shown and can be easily proved that it excells that obtained by the perineal opening.

So also has it been demonstrated that the fear of disaster in intraperitoneal bladder operations was unfounded. We have saved gunshot wounds of the bowel, we have incised and sutured gut and stomach and undertaken work with suture, ligature and otherwise through areas of possible infection, and yet have been prevented, by legends which we in these other fields ceased long ago to respect, from trespassing the bladder through the same approach and applying these same surgical principles.

Harrington, in 1893, and Mayo very recently have both proposed and described a technique for transperitoneal bladder surgery for the removal of newgrowths, and further attention has been called to this work by others.

The papers by Mayo and Goldsmith, and the discussion which followed at the meeting of this society last year, will, we trust, do much to remove the fear of bladder injury incident to abdominal surgery, which is still so much in evidence, just as it has and will continue to stimulate men to desert the ruts in bladder work and place the operative technique of this viscus on the same up-to-date and stable footing as intestinal and gastric surgery. Johnson carried out immediate suture of the suprapubic wounds made for stone removal twenty years ago, as did also Westmoreland, and the latter reports having done primary closing in numerous instances. This seems to have been overlooked by even so great a surgeon as Senn, who, so late as 1890, graphically pictures the danger of suprapubic cystotomy. Anderson in the same year (1890) suggested and advocated primary closure, and offers a way of testing the closure by water or air distention. I have been much impressed by the lack of attention to these suggestions, and to the work in this line as reflected in modern and recent surgical text-books, all of which with

few exceptions speak of the many dangers and difficulties attending suprapubic work and lean by inference or by urgent advice to the perineal operation. With few exceptions, a perineal operation is never indicated for surgery of the prostate or bladder, and the chapters on bladder surgery must be entirely rewritten. Why it is that some genito-urinary surgeons prefer the older methods, even to the use of the lithotrite, I leave you to infer.

My own attention was first directed to this matter some years ago in dealing with an extensive intraperitoneal lesion of the bladder arising in the course of operation for pelvic suppuration. A portion of the bladder fundus was included in a ligature and cut away, the accident not being recognized until after inspection by an assistant of the removed specimen. The bladder was at once freed from the ligature and direct primary suture practised with urethral drainage, resulting in perfect recovery. Later, in operating on a boy for vesical calculus, I saw no reason why an attempt should not be made to close the bladder wound primarily. I did so, draining the space of Retzius for a few days and the bladder *per urethra*. There was primary union, short convalescence, and a most satisfactory and perfect result. The case was reported at the time and met with the usual rebuff of a supposed innovation. This was particularly true from the older surgeons. However, a second case with the same good result caused one of my colleagues to try the same operation with the result of convincing him it was not only quite feasible, but desirable, in that convalescence was shortened, and many disagreeable and obnoxious features attendant upon bladder drainage were done away with. Since then we have had other cures and some failures. The failures were in badly infected bladders. It is quite possible that even in these we would have had a primary closure had our procedure been a little different. There are two necessary factors in securing good results: (1) The prevention of soiling of the operative field; (2) a perfectly tight closure.

In our cases we have brought about as nearly as possible under existing circumstances a pre-operative clean condition of the bladder. This we have secured by the administration of urotropin in conjunction with bladder irrigation with boric acid solution. At the time of operation the bladder was distended with the latter solution, which we now think is a mistake in the bad infections, as it is theoretically and practically impossible to secure an aseptic urine, or in other words a sterile bladder wall, and the distending solution serves to distribute the infection most thoroughly within the bladder, thus hindering rather than favoring asepsis of the bladder wall. In the future, therefore, we shall, when necessary or desirable to distend the bladder at the operation, resort to air for this purpose, as this will avoid the bacterial distribution by means of water should this latter be put into the bladder before incising it, and we will thereby be able to prevent soiling the bladder and abdominal wound with even dilated bacterial cultures. As a matter of fact, in the infected cases where success was not met with, the infection and breaking down began in the abdominal wall, involving the bladder union secondarily. We believe that it is not even necessary to distend the bladder at the operation, as its wall can be easily recognized, lifted up and incised even when empty.

For closure we prefer chromic catgut in two layers. The first layer is put in as an interrupted suture, each stitch being about a quarter to three-eighths of an inch apart, and not penetrating the mucosa of the bladder. The second layer of sutures is a continuous one, placed about the same distance apart in such manner that the bite of the stitches lies between the sutures of the deeper layer, thus making an air-tight and water-tight closure. The second row of sutures are put in a la Lembert. While this latter is not necessary when the peritoneum is not incised, its necessity becomes evident if we are working inside the cavity.

We have always drained the bladder by the urethra for several days after the operation, the time varying from four

days to a week. Through the retention drainage catheter the bladder is irrigated daily with boric acid solution, using at each injection three or four ounces of the solution, and repeating this a number of times until a quart or so has been used for the irrigation at each sitting.

We further think that when a severe infection exists at the time of or preceding the operation, it is advisable to drain for a day or two the space of Retzius, particularly if we have feared soiling the operative field with infected urine or with a possibly infected distention solution.

We would suggest that the plan of direct suture of the bed of the prostate might be used with primary bladder closure in suprapubic prostatectomy. While we have not as yet tried this, we shall do so, and can see no reason why, if the hemorrhage is controlled and absorbable material used, this should not be feasible.

In conclusion, we desire again to state that it has not been our purpose to offer anything new, but that we have brought this subject up in the hope that through the discussion a more modern technique, more in keeping with recent surgical advancement, may be applied in vesical surgery.

CASE OF CESAREAN SECTION IN WHICH THE UTERUS WAS INCARCERATED IN A VENTRAL HERNIA.

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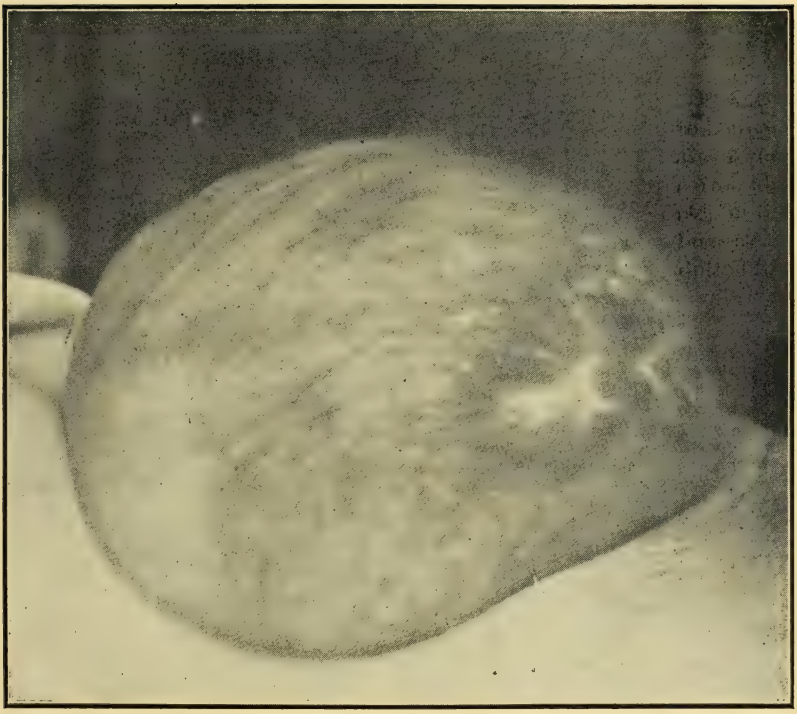
My object in presenting this brief paper is to put on record a case in which a Cesarean section was performed for a very unusual if not unique indication.

Mrs. F. H., aged thirty-nine years, was brought to the Mercy Hospital, January 8, 1907, by Dr. Jean C. Bailey, of Greensburg, who had seen the patient for the first time three days before. She found her about six months pregnant and until about ten days or two weeks previous, in her usual health. Since then, however, she was compelled to remain in bed on account of severe intermittent pains in the abdomen accompanied by a flow of blood from the vagina. On examination she found the body of the uterus corresponding in size to about a six months' gestation, outside of the abdominal cavity in a hernial sac, covered only by a thin layer of skin; neither she nor her husband, Dr. L. J. C. Bailey, who was called in consultation, succeeded either by manipulation or position to replace it into the abdominal cavity.

The pains and bleeding were readily controlled by sedatives on the first and second day after her attendance, but on January 7, that is, the day before her admission to the hospital, one of the children had an accident with a gas stove, which so alarmed the mother that she got out of bed and ran down stairs, starting both the pains and the flow anew.

On admission to the hospital the patient had a very feeble and rapid pulse and was generally in bad condition; she had been vomiting incessantly during the last twenty-four hours and had severe paroxysms of pain in the abdomen, and was bleeding from the vagina, though not in excessive quantity. Examination showed a dome-like projection of the abdomen in the region of the umbilicus produced by an enormous ventral hernia, beginning about one and one-half inches above the umbilicus, but not involving the latter. The hernia contained the entire body of the pregnant uterus to the region of the internal os; the fetal parts could be very distinctly felt through the hernial coverings. The skin was very thin and overstretched and the right side of the hernia was quite excoriated and partly ulcerated. The intestines were more or less distended with gas, causing some general tympany. The vaginal examination found the cervix quite out of reach and the vaginal fornices drawn up and funnel-shaped. For two days we tried to replace the uterus into the abdominal cavity, both by manipulations as well as elevation of the foot of the bed. The vomiting continued and we found it impossible to get a free bowel movement.

On January 11, I incised the hernial sac and found loops of intestines contained in it alongside of the uterus, which were easily reduced, but the uterus itself could not be replaced, as the neck of the hernial opening was not more than three inches in diameter, while the fundus uteri was at least six inches in its transverse diameter. Cesarean section was, therefore, the only expedient rendering the reposition of the uterus possible. By a median incision of the uterus, the child and placenta were easily extracted. The uterine wound was then closed with two tiers of chromicized catgut for the muscular structures and two seroserous sutures of the same material. As the patient's condition was quite precarious, no attempt at radical cure of the hernia was made, though the skin covering the hernia was rapidly excised and the abdominal cavity was closed with silkworm-gut sutures. The child



Ventral hernia containing six months' pregnant uterus, irreducible Cesarean section. January 11, 1907.

lived one hour. The pulse at the beginning of the operation varied from 130 to 142, but at the close it had reached 174, though the duration of the operation was only twenty minutes. Under free stimulation the pulse gradually improved until it was 104, about eight hours after operation. For several days there was rather free bloody vaginal drainage from the vagina in spite of the use of ergot.

I do not intend to weary you with the details of her subsequent course, which was quite stormy, her symptoms varying from day to day; suffice it to say that on the seventh day after operation she developed a lobar pneumonia from which she finally recovered, so that on January 29, eighteen days after operation, her temperature had become quite normal and her pulse ranged from 80 to 90. On January 31, twenty days after operation, we noticed the first evidence of a facial erysipelas, to which she succumbed February 4, twenty-three days after operation.

No exact information could be obtained in regard to the beginning of the hernial development and its mode of onset, the patient apparently knowing very little about that matter herself. Though this was the twelfth pregnancy, she at no time seemed to have had any difficulty either during her gestation or delivery.

I am well aware that a hernia of the gravid uterus is not rare in those cases where there is a very marked diastasis of the recti muscles of the abdominal wall, and that in such cases delivery has sometimes been attended with difficulty, but it is needless to point out that there is no resemblance between this condition and the case described. Not only was there no general separation of the recti muscles, but we had to deal with a distinct ventral hernia, into which in some manner difficult to explain the fundus uteri must have slipped during an earlier period of gestation remaining there and becoming incarcerated so that at the time she first came under observation it had become irreducible. Delivery could not have been effected in any other way but by Cesarean section, as the

whole uterus had been drawn up into the abdomen to such a degree that even the cervix was entirely outside of the pelvis and impossible to reach by the finger in the vagina. In addition to this there was such a disproportion between the diameter of the neck of the hernial sac and the transverse diameter of the fundus uteri, that reposition of the uterus was not only entirely out of the question, but that even delivery of the fetus through the narrow hernial ring, could it have been reached from below through the vagina, would, no doubt, have proved impossible. In a surgical sense the case is also of interest on account of the very unusual location of the hernia above the umbilicus.

EPITHELIOMA OF THE VULVA.

By Edward A. Balloch, M.D.,
Washington, D. C.

Malignant disease of the vulva is of rather exceptional occurrence. Out of 7479 women suffering from cancer, Winckel found that the vulva was the primary seat of the disease in 72, or 1 per cent. Like cancer generally it is more common in older women. The predominating type is the squamous-celled, although the adenomatous forms have been described. The medullary and scirrhus types are seldom seen, but when seen, are much more malignant than the other types. As to the exact starting point, in the majority of cases little can be determined, as these cases seldom present themselves to the observer until more or less destruction of tissue has taken place. It may develop in the labium majus, the minus or the clitoris, probably in the order named. In the greater labium the disease begins as a nodule under the skin; in the clitoris it has been observed as a degeneration of a previously existing wart. It is seldom that the disease appears as a tumor, owing to the fact that the older cells are destroyed by the rapid ulceration. Contact infection of the opposite labium is not infrequent.

As to involvement of the lymphatics, authorities differ, the majority holding that it is of late occurrence, as compared with malignant disease elsewhere. Senn, on the other hand, contends that gland infection is early, basing his opinion on a case seen by him six months after its first discovery, in which extensive regional infection was present in both groins. The

particular glands involved differ somewhat with the original seat of the disease. In cancer of the labium majus the inguinal glands are the ones chiefly involved, while in cancer of the labium minus, prepuce, or clitoris the metastasis may be in the more superficial group of lymph nodes or may appear first in the deeper pelvic group of glands. This fact is of importance in considering the propriety of operation in any given case. Owing to the free lymphatic anastomosis, cancer of a labium on one side may present involvement of the lymphatics on the opposite side.

The ulceration is peculiar in its mode of extension. Starting in one labium it will spread in an upward direction and involve successively the clitoris and prepuce, the vestibule and the opposite labium. Occasionally the mons veneris is involved. The spread is never toward the vagina and very rarely to the skin of the thigh or abdomen.

Epithelioma grows slowly, other types rapidly. Sooner or later, however, in all types, the result is a foul crateriform ulcer, discharging a thin, odorous pus.

The etiology is obscure. Some writers claim that the scratching incident to a pruritus is a determining cause, a conclusion which is disputed with great vigor by others. In the two cases herewith presented, it certainly seemed to be a factor, as in both instances it had been present many years before the development of cancer. Following the rule in cancer generally, I can see no reason why prolonged irritation should not be not only a prominent factor, but the most prominent single determining cause. The atrophic changes incident to kraurosis vulvæ seem peculiarly adapted to the development of cancer.

The diagnosis is comparatively easy in the later stages of the disease. Earlier, it might be mistaken for syphilis or tuberculosis. The ring of induration always present in malignant disease should put one on his guard as to the true nature of the trouble. Syphilis occurs, as a rule, in younger patients, and there should be present other evidences of the disease.

Tuberculosis in this locality assumes the form of lupus and presents the combination of diseased and healed portions common to this affection. The thin, parchment-like scars are also characteristic. It is also more superficial. Examination of the tissue by the microscope may be necessary to a diagnosis.

Prognosis. Untreated the disease is fatal, generally within two years from the time of its discovery. The epithelial type is slower in its progress than the other forms. In cases submitted to operation, Butlin gives the percentage of cures as sixteen, accepting the three-year freedom from recurrence as a test.

Of course, the only treatment is operative. If the case is seen early there is every hope for a successful issue. Unfortunately valuable time is too often wasted in making a diagnosis or in experimenting with various non-surgical methods of treatment, so that the disease is well advanced before it comes to the notice of the surgeon. The only operation to be considered is the radical extirpation of the affected area, with a wide margin of sound tissue. No operation that does not include a thorough removal of lymphatic glands should be considered as radical. Hitherto the removal of the inguinal glands on the affected side has been deemed sufficient, but in view of the free anastomosis of the glands on both sides, I am of the opinion that a complete operation should include the removal of all glands whose involvement is remotely possible. The possibility, already alluded to, of the involvement of the pelvic glands makes an examination as to their condition imperative. The urinary meatus and more or less of the urethra must be sacrificed in some cases and the ingenuity of the surgeon will be taxed to devise some plastic measures to remedy the defects caused by their removal. Some operators use the cautery knife in making the dissection, holding that by its use there is less hemorrhage and less danger of infection of freshly cut surfaces by unsuspected cancer cells. These supposed advantages are counterbalanced by the slow healing

of the parts and the impossibility of securing primary union. There is, as a rule, not much difficulty in securing approximation. It may be necessary to sew the edge of the cut labium to the margin of the vagina.

The following two cases may illustrate, in a concrete way, what has been said:

Case I.—Mrs. M., white, widow, aged sixty-five years; seen in September, 1902. She had been a widow for many years. Her family history was negative. Her personal history was that of uniformly good health up to 1880, when the phenomena of the menopause appeared. Among the other nervous manifestations incident to that period an intense itching of the vulva appeared. For this she consulted her physician, but, through a false sense of modesty, refused to submit to the examination which he deemed necessary to an intelligent treatment of her case. Accordingly, she had borne as best she could for twelve years the pruritus, which at times was very intense and caused her great suffering. There were spasmodic efforts at treatment of an empirical nature but no systematic attempts to cure the trouble. In June, 1902, she noticed two growths on the right labium majus, which increased in size during the following two months and were at times the seat of sharp, lancinating pains. The examination, in September, 1902, showed a well-nourished woman, in good physical condition. The labia minora were so shrunken as to be identified with difficulty. Both the larger labia showed patches of red, angry-looking, thickened epidermis, alternating with areas of grayish-white, atrophic tissue. The disease involved the clitoris and fourchette and extended outwardly to the sound skin of the pudendum and inwardly to the mucous membrane of the vagina. The line dividing the labia from the vagina was distinctly marked. On the right labium majus, at its upper part, was an excavated, fissured ulcer, one-half inch in diameter, with ragged edges and containing crusts of dried blood. At the lower part of the same labium was an elevated, hard,

red, circular nodule, one inch in diameter, sensitive to touch, and painful on pressure. Uterus and adnexa normal. No involvement of inguinal glands could be detected.

On September 29, 1902, the affected area was removed. The excision extended laterally from the sound skin to the mucous membrane of the vagina and perpendicularly from the mons veneris to a point between the fourchette and the anus, circumscribing the meatus urinarius. The clitoris was removed completely. The flaps came together without tension and healing was aseptic and uneventful. In February, 1903, the inguinal glands on the right side became enlarged and were removed, very thoroughly. In July, 1903, appeared a fungating mass in the right groin, deeply attached and apparently having its origin in the pelvis. In August, 1903, during my absence from the city, she died suddenly, the exact cause of her death being uncertain, but without healing of the cancer.

The obvious comment on this case is that the first operation was not complete, in that the glands were not removed. I have made it to myself many times. My only excuse is, that I was not certain of the exact nature of the disease, one of the arguments against its malignancy being the fact that the glands were not enlarged at any time until after the operation.

Case II.—Mrs. L., white, widow, aged seventy-six years. In this case also there was a history of pruritus vulvæ, extending over many years and lately accompanied by marked irritation of the bladder and frequent and painful urination. Examination showed an ulcer involving both labia on the left side, near the centre. The ulcer was one inch in diameter, angry looking, with a mass of friable tissue in the centre. Around the ulcer was a ring of induration. The ulcer involved tissue up to and including the urinary meatus. No demonstrable enlargement of glands.

Operation, November 7, 1903. Removal of both labia on the left side, the clitoris and a third of an inch of the urethra, together with the upper third of the labia on the right side.

Inguinal glands on both sides removed. In this case also there was an early recurrence, manifesting itself first in the urethra and resulting in the death of the patient from cancer of the bladder in March, 1904.

In this case an earnest effort was made to remove all infected tissue and glands, but an area of affected tissue in the urethra must have escaped observation, a fact not so surprising when the locality is considered.

The lessons taught me by these two cases are as follows: (1) Irritating discharges from the uterus or vagina should not be neglected; any chronic irritation is liable to cause cancer. (2) Pruritus vulvæ calls for a careful search for its cause and its removal when found; the irritation incident to this disease may cause cancer of the vulvæ. (3) The earlier the operation the better the chance of cure. (4) The more thorough the operation the better the prognosis as to complete eradication of the disease. (5) Even if the disease involve only one side, the glands on both sides should be removed and an effort made to determine the condition of the pelvic glands. (6) Any involvement of the meatus urinarius or the urethra calls for careful examination of the urethra, supplemented by a cystoscopic examination.

SURGICAL INTERVENTION IN THE TREATMENT OF NEURASTHENIC STATES.

By C. M. Rosser, M.D.,
Dallas, Texas.

Taking literally the teaching of writers upon that type of neuroses represented by neurasthenia, surgery would seem to be exempt from responsibility, both as to cause and cure, since surgery is perhaps the more direct of modern science with which the profession is concerned, and because that disorder is described as the most indefinite of the diseases of the catalogue. Writers have contented themselves to say, what might be more tersely put, as follows: "Neurasthenia is a deflection from normal physiological action, insidious in approach, vague in exhibition, of indefinite course, obscure if not wanting in pathology, but of increasing prevalence, the treatment of which is ultimately rest." They give unstable heredity as the predisposing factor, and excessive exertion as the exciting cause. This description would, in itself, render such cases at once unpromising and unattractive, but if essentially burdensome they are intrinsically worthy, coming as they do, for the most part, from the world's unceasing workers and gathered from the several walks of life, many are indeed martyrs to the people's good through public progress.

As a class, they pass from the physician to the neurologist, the neurologist to the retreat or asylum, while others seek the surgeon, willing that he should find glory or they the grave. But the accepted theory which thus charges parentage and

improvidence, while correct to a degree, is yet incomplete, ignoring as it does many influences which, if otherwise exerted, might obtain different results.

Certainly no force is so persistently faithful as inherent integrity, but the law of compensation familiarly observed throughout nature's behavior, is, when appealed to, always comforting, and it must not be forgotten that stagnation induced by idleness, may influence as harmfully as the overstrain attendant upon excessive effort, the true philosophy requiring the maintenance of a parity between the processes of waste and repair, the work of our physiological clearing house. Those agencies or conditions, then, which disturb injuriously this necessary equilibrium, whether by antecedent weakness, acquired habit or intercurrent disease, are to be classed as causes, and those methods which circumvent, counterbalance or remove them should be included in all rational systems looking to relief.

There is, therefore, something for the sociologist besides flaying our forefathers, and for the physician further than to advise idleness, and recommend rest.

Ideal ideas would be competent more often if their plans could be made practical, but the locally tired cannot always travel, the weary may not always suspend his labors any more than the already here may return to be born again of more acceptable parentage and to more sustaining environments. Among the sterner realities of life there is sickness and suffering, and surgery is a practical art. It regards conditions as concrete facts and applies itself to them as such. The relation, then, that surgery bears to neurasthenia depends upon its ability to do in some definite way its duty toward a class of cases in which physical disorders are engendering or adding embarrassment to the vital forces and thus lessening resistance or increasing tissue waste, one or both, and usually both.

The bank balance is reduced, both by failure of deposit and by checks drawn upon it, and this illustrates the double

method of organic depletion to which reference has been made. The two economic forces, which operate for the preservation of physiological ratio, are relaxation as fully realized in sleep, and nutrition the normal way of reproducing or replacing its losses, due to necessary elimination and natural decay. Interference with those bodily functions, in any degree, tends, then, toward exhaustion and must invariably precede its entire production. Individual resistance, aid offered, and the agencies utilized will determine the progress and the outcome of any contest against impending collapse, and in no instance should the sufferer be rashly regarded as a congenital defect, who has either been preordained to defeat thereby, or whose lack of wisdom has led him to a point where nothing short of an abandonment of his ambitions may restore to tolerable existence. The truth is, neurasthenia is both a psycosis and a physical disorder, and these conditions are so interdependent that it is impossible to separate them. To illustrate: Disappointment leads to despondency, despondency to ill digestion, these to insomnia, and the sufferer is fortunate if, after a while, his physical distresses growing out of mental disturbance can still be classed as functional. Pain induces discomfort and disability, both of which interferes with glandular activity, retards healthful metabolism, and if long continued, affects in a more or less definite way all bodily conditions. And so it must be that diseases which offend by disfigurement, discourage by disability, embarrass through systemic inoculation, or by actual inroads obstruct the discharge of such functions as result in health, are all liable as creators and conspirators.

For these reasons surgery is positively concerned and may be associated with both the production and progress of neurasthenia, as we shall now see.

Deformities. Simple as may seem an extensive burn upon an exposed surface it may, by occurrence, in sensitive persons, incline to a morbid mentality. Surgery, by skin grafting, holds the key as the only relief. Strabismus, club-foot,

and other congenital deflections are subject only to surgical correction, and should be prompted, if alone, for mental effects. Goitre, now successfully removed by surgical methods, is both a mental menace and a physical forerunner of conditions too well known to need citation.

Stomach dilatation due to pyloric spasm or obstruction and inanition from uncured ulcer are accompanied by both distress and actual decline in vitality, and surgery alone may remove those causes. Disorders of the bile passages, which interfere by reflex methods and with the production and distribution of that secretion, have recognized followings, which are fruitful of such results as surgical intervention may alone avoid.

Stones or other infective agents in the renal system are, by the employment of *x*-ray and clinical examination, easily discovered and freely removable, but when remaining produce pain and otherwise disturb those organs which have no separate counterpart. Movable kidney, if autodiscovered, and particularly if erratic, centres a self-examination inconsistent with nerve equilibrium, and should be surgically corrected. Chronically inflamed appendices by reflex disturbances invite indigestion, and they are better out.

Pelvic inflammations, due either to infections or traumatisms, lead to engorgement and to a train of symptomatic distresses which, on account of the delicate adjustment of the nervous mechanism in that locality, will usually induce depression as an incident and disease as a consequence if unduly prolonged. The same may be mentioned in regard to rectal ailments, all excepting the malignant types of which are quite susceptible to surgical relief.

This review only indicates a few prominent conditions which are pertinent at this time, and a knowledge of their habits of chronicity, and some of them toward fatality in the not far future, suggests that for all reasons they be given surgical attention before the more serious consequences shall have convened. We have heard much of preventive medicine, and

the applause to which it is entitled should, for the reason set forth, be extended to include preventive surgery.

Greater difficulty arises in instances where a neurosis is already established, and the surgeon finds upon investigation that the patient's complaints are altogether out of proportion to the indications presenting. The question also frequently comes whether there is, indeed, any surgical condition associated, and this will be perhaps more often negative than otherwise. In such an event, the responsibility does not have surgical meaning, and the only thing that is left is a discharge of that obligation which all men owe, to substitute suggestive help for actual when the latter is inappropriate or impossible. There are cases, however, in distressing numbers, which have progressed to a point of positive pathological derangement, due to the several associated activities which if earlier handled might have been surely helped, but which having become established in an invalidism will not likely entirely respond even if the causes, in so far as possible, shall have been removed.

If there are functional disorders, the disturbance may be too long permitted, and then we must remember always that facts are not altered at all by our lack of information concerning them. The problem presented will be, how to insure against a surgical result that will not by failure to appreciably improve the studied symptoms further distress, discourage, and tend to destroy, and at the same time preserve a good conscience toward the afflicted, which we would, if possible, benefit and toward the science which we must never discredit. It will be borne in mind that when adventitious embarrassments are implanted upon prenatal degenerates, the same good results are not to be expected, with confidence.

The rule, I think, should be *to make that same careful clinical investigation of each case which would be incumbent, if complaints were not exaggerated, and then to operate upon the diseased condition found, if such are demonstrated, thus giving the patient always the benefit of any reasonable doubt.*

FALSE ANEURYSM OF THE FEMORAL ARTERY, FOLLOWING TYPHOID FEVER.

By Robert S. Cathcart, M.D.,
Charleston, S. C.

The rarity of this complication, occurring in typhoid fever, as is proved by thorough search of medical and surgical literature, which has revealed no reported case, prompts me to report to this Association a case of this unusual condition that has lately come under my observation:

On August 20, 1908, J. M. T., white, male, aged thirty-three years, occupation, farmer, was referred to me by Dr. A. G. Eaddy for operation for aneurysm of the left femoral artery.

The patient's history was as follows:

Family History. Negative.

Previous History. Had gonorrhea six years ago. Denies syphilis. Ten weeks ago had typhoid fever, lasting four weeks, followed by an attack of malarial fever. No history of trauma.

Present Condition. Fairly developed and nourished. Heart and lungs normal. Has never entirely recovered since the beginning of his illness with typhoid fever, only being able to sit up in a chair occasionally. Three weeks ago began to have pain in Scarpa's triangle and felt a small lump in this situation about the size of an almond. This became gradually larger, and the pain increased. Did not notice pulsation until three or four days later. Examination showed a flattened tumor in Scarpa's triangle, in size about $2\frac{1}{2}$ x $3\frac{1}{2}$ inches.

Skin overlying it was hyperemic. Pulsation visible and expansile, stopped by pressure on the femoral artery above. The tumor also decreased in size by pressure. Pulsation not felt in the femoral artery below. Circulation in the leg was good. Bruit heard on auscultation. No enlargement or edema of the limb.

Two days later, August 22, the tumor had increased in size, became more flattened and skin more deeply congested. August 24, skin became darker and an area of softening over the tumor noticed. Severe pains continued. A small aspirating needle was inserted in tumor and pure blood withdrawn. On August 26, operation was done under ether anesthesia. As a preliminary, an oblique incision, slightly curved, was made above Poupart's ligament, muscles separated and the external iliac artery exposed extraperitoneally, a provisional ligature was placed around the artery and the artery clamped with rubber-covered forceps. An incision was then made over the aneurysm in the direction of the femoral artery, with the intention of doing a Matas operation, if possible. Just beneath the skin and fascia a well-organized clot was found. On removing the clot, severe hemorrhage followed, notwithstanding the fact that the external iliac was clamped above in the upper incision. The hemorrhage was controlled by pressure with the finger in the upper part of Scarpa's triangle. It was due to recurrent circulation through the deep epigastric and deep circumflex iliac arteries, which were exposed and clamped at their origin.

No true sac was found and the femoral artery in Scarpa's triangle, for its entire length, had apparently ulcerated away with the exception of a small portion of its posterior wall, which was quite thick. Attempts to pass sutures here were futile owing to the friability of the tissues. The distal and proximal openings of the artery had a flared-out appearance. Ligatures were placed on the femoral (at the apex of Scarpa's triangle), the deep femoral, the superficial circumflex iliac and the superior external pudic. In the upper incision the

external iliac was ligated and also the deep epigastric and deep circumflex iliac arteries. The upper incision was closed as in hernia operations, and the lower wound packed with gauze. The patient was severely shocked from hemorrhage, but reacted with rectal injections of normal salt solution. The right leg was bandaged up to the hip-joint and the left leg wrapped in cotton batting and surrounded with hot water bags.

August 28, patient was doing well; no signs of gangrene. Faint pulsation was felt in the dorsalis pedis artery.

August 30, lower two-thirds of leg began to show signs of dry gangrene. Temperature, 101°.

September 1, gangrene was more marked, but had not extended. On scratching the skin, just above the knee-joint, circulation was demonstrated.

September 2, amputation of the leg through the upper and middle third of the thigh. Circulation in the flaps found good. Patient made a good recovery.

On account of the faint circulation that was demonstrated at the knee-joint and the good circulation obtained in the flaps, I believe that the limb would have been saved had it not been for the weakened heart action, consequent upon a long illness of typhoid fever and the loss of blood.

Complications of the arterial system in typhoid fever are not common. The cause of the complete destruction of the femoral artery in this case, I believe, was due to an ulcerative arteritis produced by the localization of the typhoid bacilli in the walls of the vessel. That the circulation in the leg was not interrupted is explained by the formation, primarily of an autochthonous parietal thrombus, which as it increased in size the blood current channelled. Neither the patient nor his physician noticed symptoms of thrombus or embolus. There was and had been no swelling of the limb besides the tumor in Scarpa's triangle and no evidence of gangrene.

That the typhoid bacillus penetrates and localizes itself in the arterial walls has been demonstrated by several writers.

Dr. W. W. Keen, in his book on *The Surgical Complications and Sequels of Typhoid Fever,* quotes Rattone as reporting four cases in which he was able to obtain pure cultures of the typhoid bacillus from sections of the arterial tunics.

Dr. Osler, in reviewing a series of 1500 cases, states in regard to the arteries: "The most important condition is arteritis, which occurred in four patients in this series. In one, in the middle cerebral, in two, in the femoral, and in one, in the brachial artery. It is probably due to a localization of the typhoid bacillus or some other organism in the walls of the vessel."

In my case through some oversight the clot was not preserved for microscopic examination nor cultures made from it.

This report does not give full justice to the subject. It is only to bring to your attention another surgical complication of a disease, which at one time was considered purely medical.

HEREDITARY HYPOPLASIA IN MAN, DUE TO DEGENERACY.

THE UNDERLYING BASIS OF THOSE CASES HAVING A HEREDITARY ORIGIN, AND THE RELATION OF THIS UNDERLYING CAUSE TO THE FUNCTIONAL NEUROSES, TUBERCULOSIS, INFECTIONS, AND IMMUNITY.

By Charles P. Noble, M.D.,
Philadelphia, Pennsylvania.

It is my desire to bring before the profession what I believe to be the primary cause of many groups of morbid conditions heretofore considered as being separate, or as having a very loose relation one with the other.

It is known that the impregnated ovum has within it potentially the whole man or the whole woman; that is, body, mind, and spirit. It has within it potentially all that constitutes temperament in the adult and also that which is spoken of as heredity as distinguished from environment, which last, however, as a directing force is largely made up of the heredity of the mother.

In order to lend directness and lucidity to this presentation of the subject, I will state here that the factor, or underlying cause, of the various morbid conditions which will be considered later is the degeneracy of the particular line of life active through the person of either the father or the mother, or through both, conveyed by the spermatozoön, or by the ovum, whereby the impregnated ovum, potentially the new individual, fails to receive from his progenitors that as yet

unexplained something which brings it about that this unicellular organism shall in due time become evolved into a normal human being.

When the defect in the ovum is very great in degree the resulting individual is very abnormal. Without stating it as a fact, I will suggest that this is the explanation of certain abortions and of certain monsters under the so-called congenital abnormalities of structure, while others doubtless are due to the environment of the ovum while yet in the womb of the mother.

This is the explanation of idiocy, imbecility, and dulness of intellect in the group of cases not caused by accidental influences acting through the mother during pregnancy.

It is the explanation of what happens when a subnormal child goes to school. He either has a fairly good body with a dull intelligence (the microcephalic type), so that he does not learn his lessons so easily as his fellows; or, on the other hand, he is unusually bright, but has not the physique to withstand the pressure even of child life, and so that it is said the child is all brain, but has a very poor body. Between these types are those of the so-called nervous children—that is, those who have an unstable nervous system.

When the subnormal girl reaches puberty, those changes which convert the girl into a maiden fail to take place at or about the eleventh year. At this period the neck of the normal girl loses its flatness, such as a boy has, and it is no longer possible to see the sternocleidomastoid muscles. This is due largely to the development, physiological hypertrophy, or evolution, of the thyroid gland, aided somewhat by the increase in the thickness of the adipose tissue of the neck. The subnormal girl retains the body form of the child, wherein girl and boy are very much alike in their figures. The bones fail to develop, the hips fail to broaden, and the limbs, the body, and the face do not attain the rotundity which characterizes the woman as distinguished from the man. The breasts do not develop, and in extreme cases the pubic hair

is late in growing. In other words, as it is stated, puberty is delayed. The body retains the form of a neuter—that is, of a child. The pelvic organs do not develop, the vagina remains more like that of a girl, and so do the uterus, Fallopian tubes, and the ovaries. It is equally true of the ligaments of the womb. This failure in development may be complete or may be partial, and the least manifestation of it is the so-called pinhole os of Marion Sims, associated, as it is, with narrowness and anteflexion of the cervix. Puberty in the subnormal arrives, when it does arrive, not at thirteen in this latitude, but at from fourteen to twenty, depending on the original defect in the ovum, aided, it may be, in particular cases, by the environment of the child after its birth. Likewise, it will be found in each of the groups of cases that the condition may be acquired, as it is said, rather than due to the causes of which we are treating. That is, it may be due to the diseases of a nutritional character, to the influence of acute disease, such as typhoid fever, or to some accident profoundly influencing the nervous system. Heretofore it has been said that these conditions are either congenital or acquired.

After marriage such subnormal girls are relatively sterile. Some do not become pregnant; they torment their husbands and worry their doctors, and then comes nervous prostration from worrying over the situation. Others become pregnant, and the womb is imperfectly developed, resulting either in abortions, in abnormal labors, or in lacerations; many of these women have puerperal infection. Then comes nervous prostration from having had this experience. Such women are mentally unstable and everybody says they are peculiar. They are not like other women; that is, they have hypoplasia of their entire bodies. It is not merely arrested development of the pelvic organs, but arrested development of the body in general. Their bones and their muscles, their hearts, and their arteries, and, most of all, their nervous system—central, spinal nerves and sympathetic—are imperfectly developed; that is, organs and parts are in a state of hypoplasia, or arrested evolution.

Such women very often have retrodisplacements, when they do not have anteflexion, and all have poor ligaments; round ligaments and uterosacrals, and the broad ligaments, and the Fallopian tubes, and the ovaries likewise are imperfectly developed—are in a state of hypoplasia.

Many of these women have, at about the age of eleven, what is called chlorosis, which is a part of this general situation—it belongs in this group. Even Virchow missed the point. He recognized the fact, but did not see the explanation. He said that chlorosis was incurable, because dependent on hypoplasia of the heart; whereas the truth is that hypoplasia of the heart is a mere incident in the general situation. Heretofore it has been said that puberty is arrested because of malnutrition resulting from chlorosis, whereas the truth is that the two have the same primary cause.

It was stated that many of these women have puerperal sepsis. This is mentioned here separately, but will be taken up later in connection with other infections.

This principle explains all the cases of displacement of the uterus not due to accidental causes acting on normal individuals.

Now comes the loose kidney, the so-called nephroptosis. It has been known that such patients usually are queer, that they have many nervous symptoms. Men who are routinists and who have operated on these patients indiscriminately have found that many of them are no better after nephropexy. Others who were more studious and thoughtful, who have taken the trouble to differentiate the cases into groups, those having direct local symptoms, those having reflex symptoms, those having hysteria, and those having nervous prostration, have found that nephropexy cured the patients in the group having local symptoms and the group having reflexes, and so they have restricted their operations to these two groups and have advised that the patients in the other two groups, namely, the hysterics and the neurasthenics, shall not be operated on; or, if operated on, that these nervous disorders

shall receive appropriate treatment. The explanation is that the two groups, those having direct and those having reflex symptoms, are instances of acquired nephroptosis in persons of normal development, almost without exception; whereas the other groups are chiefly made up of the patients primarily defective. Hence the mechanical cure of the local condition cured the symptoms in two groups and could not alter the primary basis of the trouble in the other two groups. In practice this will be somewhat mixed, as the groups will overlap each other. Some patients primarily defective will have local symptoms, and operation will relieve the local symptoms, and some patients having acquired nephroptosis as the result of malnutrition due usually to acute disease, less often to long-acting causes, and rarely to traumatism, will develop neurasthenia; hence operation in these cases will cure only the local or reflex symptoms, even in patients primarily normal, and will not influence for good, or will make worse, those having hypoplasia from arrested development.

My work, as a gynecologist, has brought me in relation more particularly with hysteria, neurasthenia, and reflex neuroses. It is probable that such conditions as epilepsy, catalepsy, hysteria, insanity, exophthalmic goitre, etc., have the same basis in degeneracy as those conditions already considered.

As showing the relation between the two groups of cases already studied, it was two gynecologists, Edebohls and myself, who worked out these facts. It has long been observed —and this idea was especially elaborated by Harris—that those having loose kidneys have a peculiar body form; this body form is the same as that which has been discussed in connection with delayed puberty and is due to general hypoplasia. It is the form of the child—the neuter. Harris failed to recognize the underlying cause of this body form. Glenard long ago recognized that dropped stomach and dropped intestines were associated in certain cases with dropped kidneys, and as a result of his teachings, which represent a

half-truth, there came confusion in the study of nephroptosis, because the underlying cause of each was not understood. His teaching failed to take into consideration the fact that certain cases are developmental in origin and that others are acquired; hence the confusion.

This group of visceral ptoses, which includes stomach and intestines, the kidneys and the liver, and the spleen, and the uterus, when not acquired, are all due to developmental causes—to a primary defect in the ovum. But this is not all, because they have general hypoplasia; the liver cells and the cells of the gastric and of the intestinal glands and of the pancreas all feel the influence of the primary defect in the ovum. In addition, the nervous system suffers the consequences of this primary defect, and so we have so-called nervous indigestion, which is merely the outcome of general hypoplasia, when it is not reflex in origin. It has been known for centuries that the consumptive has a peculiar body form, speaking broadly; he or she is not erect; there is a general appearance of lassitude and languor, due to lack of tone and to poor nutrition of the ligaments and of the muscles and of the fasciæ of the body. The form of the vertebral column is altered, its curves are changed. This change lessens the capacity of the chest and alters the configuration of the abdominal cavity. To speak first of the abdominal cavity: This change in form alters the direction in which intra-abdominal pressure exerts its force. Added to this is the lack of tone in the muscles of the abdomen, and these two factors acting in concert on the viscera of the abdomen and pelvis, with their suspensory ligaments and the other structures which directly support them, themselves feel the influence of the primary defect in the ovum and so have lax tissues, which yield insufficient support—bring about visceral ptosis. The result in the chest is that, owing to the abnormal configuration of the bones, there is less room for the lungs, and, owing to the hypoplasia of the ribs and of the muscles of respiration and of the nerves and nerve centres which control respiration,

there is defective respiration. These factors, together with the hypoplasia of the lung tissues, make this group peculiarly susceptible to the invasion of the Bacillus tuberculosis; and so it has long been recognized that such people—that is, those having such a configuration of their bodies—are liable to this disease—consumption or tuberculosis.

It is noted above that the women belonging to this group are peculiarly liable to the development of puerperal infection. I have long observed that these women are especially liable; also that those on whom I have operated for dropped kidney, and the nervous group of which we have been speaking, have been especially liable to develop infection of the urinary tract from catheterization following operations. Now we see that the same group, as has been known for years, are peculiarly liable to develop consumption. What is the explanation? We must go back to the primary defect in the ovum which results in what was formerly called low tissue resistance to infection, or, as it is now stated, a low opsonic index; that is to say, that unknown something, in the blood plasma, which enables the individual through the action of the so-called opsonins to lessen the virulence of the infecting organism. Is not this, in part, the explanation of the nature of infections, of the nature of the loss of relative immunity, of the fact that some are susceptible to the actions of infectious organisms and succumb, and that others who are normal, or who are more normal than those just mentioned, are able through their opsonins to overcome the infecting organisms and thus to recover?

It was first noted by Edebohls that appendicitis of the chronic type, especially, is very common in association with loose kidney. He attributed it to the mechanical influence of the dropped kidney on the vessels of the appendix. His observation was correct, but is not his explanation erroneous? Is not the true explanation the same as that of all of the other groups?

It has long been known that those belonging to the groups

discussed are queer people. Their minds are unstable and do not work like others. They do not think soundly or reason accurately, as a rule, and their judgment is apt to be bad. In other words, intellectually they are defective. Likewise the moral perversions belong peculiarly to this group. Thus in this group also are the hysterics, etc., and they are all prone to develop neurasthenia. What does this mean? Hypoplasia of the nervous system due to a primary defect in the ovum. Does not this make the whole subject simple and easy to be understood?

Now, just as with the displacements of the uterus and with the displacements of the kidney, so it is with the chest cases, and with the nervous cases; we can have acquired troubles due to the environment of the individual who is normal, or who is only slightly defective, and the two groups, the cases primarily due to heredity and those primarily due to environment, can be differentiated. In practice the prognosis in one group is good and in the other group must be guarded, is less good, or is bad. The line of treatment must be different in each group. In the acquired cases all that is necessary is to remove the cause and to remove or to cure the particular trouble by therapeutics, medical or surgical, and then the previously normal individual becomes well. In the other group, the cases due to hypoplasia, if in the case of an adult, the cause cannot be removed. It lies back in the ancestors who cannot be reached. So here we must get at the fringes of the question instead of at its centre, fundamentally. We can cure by therapeutics, medical, hygienic, or surgical, the secondary results of this primary defect; then along the lines of nutrition, and along the lines of hygienic living, we can improve the condition of the individual until he is well enough to say that he is well again. But that individual can never do a full man's or a full woman's work. When the strains and stresses of life come on him, or her, comes the breakdown and nervous prostration.

And this is not all. This explains what we hear so much

about, namely, the inadequate results attained by certain specialists, the kind who are mere routinists, who are superficial men—in other words, who are not experts—those who have not only a narrow field, but also have a shallow education, and who have selected a specialty, not that they may get at the root of the questions which come before them for solution, but in order that they may have an easy time, and not be bothered with too many problems, and so have not gone to the foundations of medicine, which are as broad as natural and physical and mental science, which is necessary for the expert, who is a true specialist. So when cases belonging to this general group (in which are represented many functional conditions or neuroses, involving particular specialties) come to these superficial or false specialists, the treatment takes the form of the useless spectacles, the nose-washes and the blowing of air through the respiratory passages, the silly use of tampons as a routine, or the painting of the os with iodine or the mere routine employment of the rest cure without understanding, and the use of electricity for the titillation of the nervous system—the playing on the mind by causing the vibrator to touch the body, or what is called by such men "psychologic therapeutics," practised by sending sparks through the patient from Leyden jars. Such men have brought specialism into disrepute among the unthinking, who have failed to recognize that such men are not specialists—that is, experts—but narrow men, with a shallow education, who neither know, nor can see, the truth, when it comes before them; and so it comes that all this routine practice, based on ignorance and incompetence, not only does no good, but wastes the patient's money and brings medicine into disrepute. The truth is that in the diseases belonging to each specialty the same factors are at work, and the explanation of the failure to get good results is that doctors have not separated the cases developmental in origin, due to a defect, primary in the ovum, from those cases in which the disease is acquired, in a normal or relatively normal

individual; or, to use the usual terms, they have confused direct and reflex sypmtons with hysteria, nervousness, and neurasthenia.

This subject (degeneration or hypoplasia) has long occupied my mind, and already twenty years ago I recognized the truth of it so far as it applies to the cure of women having delayed puberty. I appreciated the truth that this was developmental in origin (arrested evolution) and must be treated along nutritional and hygienic lines; but the word congenital was confusing, because one's mind was arrested in its processes at the period of birth and did not go back to the beginning, to the ancesters, and to the influences of heredity on the fertilized ovum—one's reason was lost in the fog or mystery of the creation of a new being.

I was greatly aided in the solution of the problem as applied to this group by the late Harrison Allen, the last—more's the pity—of what may be called the naturalist school of physicians. He was really a great scientist, although he was known as a rhinologist, the one who laid the foundations of the modern surgery of the nose and throat; but he had the broadest of training. He was a great craniologist, one of the most learned in this field in the world. He had been a general surgeon and had given it up because the field was not inviting to a man of his type of mind. The field was too broad and, therefore, the tendency was to make its practitioners shallow. The human mind is not great enough to go to the bottom of many things; so in time Allen, having a philosophical mind, appreciated the great truth, that a stream of given volume must be narrow if it is to become deep. And so after laying the foundations of his career very broadly, he restricted his activities within a reasonable compass.

I was puzzled, as a young gynecologist, by the condition known as "delayed puberty." I saw many cases of it in my dispensary work, where, naturally, the decadent are numerous. I recognized that such patients were peculiar people, not like others; also, that I had not been able to do much for them. I talked with Dr. Allen and he told me that he thought that it would be of interest if I should refer to him a number

of such patients to study from the standpoint of a student of natural science. I did so, and he reported his findings in about twenty of them. The report was that their osseous systems were undeveloped, their frames as much like men as like women—that is, they were neuters—that their crania were undeveloped, that they had high-arched palates, that their vocal cords were ill-developed, and that such people could not be singers. He also recognized the fact that their nervous system was ill-developed, but he stopped with birth and called the condition congenital. But it is evident that the only way to do anything with these people, practically, is along the lines of nutrition and hygiene, and so for twenty years I have treated this group, and then the dropped kidney group, along these lines. The word "congenital" was the stumbling-block. Dr. Allen and I each recognized that the trouble was developmental, and a hypoplasia, but we thought that the trouble was primary in the nervous system and exerted its influence through the trophic nerves, those controlling nutrition, resulting in malnutrition and arrested development.

I have long noticed that in this group of women it is very common to have leucorrhea, and have taught that this, when the discharge is thin in character, comes from the endometrium, and is due to malnutrition and not due to local disease. I failed, however, to appreciate what I believe is the fact, namely, that this is just the same condition as that previously discussed, that it is due to a hypoplasia of the cells of the endometrium so that they fail to functionate normally and are subject to degenerative changes in structure. Is it not the underlying cause of so-called glandular hypertrophy of the endometrium, and is not this the same pathological condition found in the throat and called adenoids and diseased tonsils, and does not this theory explain this group of debilitated women, and also all the children who are not vigorous, and who get adenoids and diseased tonsils and become mouth-breathers?

Now how are we to differentiate the defective children,

those in whom puberty is delayed, those with visceral ptoses, with consumption, with neuroses of hereditary developmental origin, from those in whom it is acquired? By eliciting the family history and by looking for the stigmata of degeneracy, particularly, because this is the easiest, for the high-arched palate of the degenerate. All the other stigmata of degeneracy are as significant, but they are less easily recognized.

It has been only recently that the truth which lies behind all these isolated facts, so long known by many, came to me through the correlation of these isolated truths, whereby one obtained the premises, the proper point of view, from which to see the truths above noted, and on which to reason, and then the conclusion became inevitable that the real basic nature of all these apparently separate groups of morbid conditions lies in the defective ovum due to heredity and to the degeneracy. Now here lies the explanation of that ancient proverb, that the sins of the father are visited on the children to the third and fourth generation—not because the Almighty is revengeful, but because this is Nature's law and is, therefore, inevitabe.

RICHARD DOUGLAS, M.D.

IN MEMORIAM.

RICHARD DOUGLAS, M.D.

By William D. Haggard, M.D.,
Nashville, Tenn.

On February 19, 1908, one of our most distinguished Fellows died of chronic nephritis at his home in Nashville, at the age of forty-seven. He had attained a position of great prominence, not only in his native city and State, but throughout the entire South, and his work on *Surgical Diseases of the Abdomen,* published in 1904, gave him an international reputation to which by his labors he was so richly entitled. His untimely death was doubtless largely attributable to the immense amount of labor which he put on this work. A man naturally of frail constitution, he nevertheless posessed an indomitable energy and an insatiable ambition. He accomplished this amid the trying cares of a large surgical practice.

Dr. Douglas belonged to the group of young surgeons who derived their inspiration from Tait and his contemporaries, who began their work in the abdomen in the eighties and early nineties. He was a student of Mr. Granville Bantock, of London. He had graduated at the Medical Department of the University of Nashville in 1881, and completed his course in the Jefferson Medical College in 1882. From the beginning he gave promise of the brilliancy that characterized his subsequent work. The painstaking care which he possessed as a diagnostician was only exceeded by untiring zeal in his library and the keen interest he took in his operative work. His profession was his all in all. He was elected to the Professorship of

Gynecology and Obstetrics, and later to the chair of Abdominal Surgery in Vanderbilt University, and became one of the most popular and efficient teachers who promulgated the new era in abdominal surgery. He was one of the Founders of the Southern Surgical and Gynecological Association, and contributed many important papers. He was greatly interested in peritonitis from an academic as well as a clinical standpoint. His first contribution before this Association was on that subject in 1894. At the Charleston meeting of 1896 he read a paper upon "Splenectomy Statistically Considered," and many members will recall the dramatic rendition of his paper at the evening session. He was a beautiful speaker, as well as a fluent writer, and his thorough preparation upon any theme, together with a straightforward recital of his own experience, was always a refreshing feature of any medical program. In 1898 his thesis was entitled "A Study of Retroperitoneal Neoplasms, with Special Reference to Diagnosis." It is one of the most exhaustive monographs on the subject. Having served as Treasurer in 1895, Vice-President in 1896, he was elected President at the St. Louis meeting, in 1898. He chose for his address at the Memphis meeting, over which he presided, "Acute General Peritonitis." It was a masterly effort.

One of the most beautiful acts of his life was the tribute which he paid to the Founder, early Secretary, and ex-President of this Association, in his address at the Bi mingham Memorial meeting, on the life and work of W. E. B. Davis. Unfortunately, during the later years his health was such that his genial presence was not lent to the sessions, but he acted as a member of the Council and always had a great pride in the Association. He was likewise honored by other societies, having been President of the Tri-State Medical Society, of Alabama, Georgia, and Tennessee. In addition to the studies above mentioned, he wrote a very complete memoir, one of the best ever written, upon the subject of "Cysts of the Urachus." In 1899 he contributed a very strong article on "Gunshot Wounds of the Abdomen," in which he had some very brilliant experiences at the Nashville Hospital. Of late years he became very greatly interested in the subject of tubercular peritonitis, and, curiously enough, his last essay before the Nashville

Academy of Medicine, as well as his first notable paper, was on the treatment of diffuse peritonitis, a disease which he had combated so frequently and studied so diligently.

No man did more to inspire the younger members of the profession than did his brilliant example and phenomenal success. He was easily the leader of his profession in his State and had the confidence of his confrères to a remarkable degree. With the many endowments which nature had lavished upon him, making him a veritable genius, it also chastened him with a peculiarly irritable disposition, which was doubtless due to a very sensitive nature. As the result of this he had many imaginary and real grievances, which largely embittered his professional life, but at the same time drew around him many devoted friends. He had a peculiar fascination for the student, and was the preceptor of a notable group of young men of his city and State, all of whom have shown the results of his example and inspiration. He combined to a rare degree the composite elements which are so difficult to assemble in the making of a distinguished surgeon. Above all, he was a great student, with an unparalleled energy and burning ambition; he was a slave to his profession, and his devotion to his work was supreme.

His like will not soon cross the firmament of southern surgery.

A. M. Cantledge

A. MORGAN CARTLEDGE, M.D.

By L. S. McMurtry, M.D.,
Louisville, Ky

On May 4, 1908, Dr. Abiah Morgan Cartledge, of Louisville, Kentucky, a distinguished member of this society, at one time its President, died of acute dilatation of the heart at his home in Louisville. He was a surgeon of superior attainments, a successful practitioner, and a man of striking personal character and qualities. He was not quite fifty years of age, and was struck down suddenly at maturity in the midst of his activity and usefulness.

Dr. Cartledge was born at Winnsboro, Fairfield County, South Carolina, and his family were of Welsh extraction. His father was a clergyman and a man of good education and superior character. From his father he received an excellent education, and was well prepared to enter upon the study of medicine. When about twenty years of age he came to Louisville and entered the Hospital College of Medicine, the medical department of Central University of Kentucky, from which institution he graduated with honor in 1882. He won by competitive examination one of the four positions of resident physician at the Louisville City Hospital, and served throughout the year after his graduation in that institution. He then began the practice of his profession in the city of Louisville, and entered upon a professional career full of usefulness and honor. Two years after graduation he received an appointment as a teacher in the institution from which he had graduated, with the title of Lecturer on Surgery. Soon afterward he was called to one of the chairs of surgery in the same institution, and filled the position with credit to himself. These were years of devoted work as a student, during which time he familiarized himself with the literature and most advanced scientific work in all departments of surgical pathology and operative technique. In 1887 he resigned his place in the Hospital College of Medicine and accepted a

position as teacher of anatomy in the Kentucky School of Medicine. After filling this place for three years he was offered the Chair of Principles and Practice of Surgery and Clinical Surgery in the Louisville Medical College, which he accepted, and remained a member of this faculty during the remainder of his life. During his later years he occupied the Chair of Abdominal Surgery and Gynecology. While giving his time assiduously to his duties as a medical teacher, he was actively engaged in the practice of his profession. For a number of years he did an extensive general practice in the eastern part of the city, but gradually became more and more engrossed with surgery, so that in time he limited his practice entirely to surgical work. All his tastes were in the direction of surgery; early in his career he became identified with teaching this department, and both by taste and circumstances was led into this inviting field of practice.

At the time Dr. Cartledge entered the medical profession, the discoveries of Lister were rapidly revolutionizing the entire science and practice of surgery; the far-reaching researches of Pasteur and the epoch-making discoveries of Koch were becoming generally accepted, and all departments of medicine were being rehabilitated. Dr. Cartledge was enthusiastic in his adoption of the new surgery, and its brilliant achievements won his devotion. The extension of the field of surgery, with brilliant results, especially as applied in the abdomen, enlisted his most enthusiastic attention. He was one of the early and valuable contributors to the surgery of the gall bladder and appendicitis.

Dr. Cartledge was a ready and forceful speaker, and exerted a powerful influence in the discussion of surgical subjects. His memory was accurate, his manner earnest, and he utilized his knowledge and experience with great force upon the floor of the society and before the medical class. His literary work was likewise clear and convincing, and all his papers show a discriminating judgment and careful clinical observation. Most of his important contributions to medical literature were made to this Association, and his papers will be found in the volumes of its TRANSACTIONS, beginning in 1892 and continuing to 1907. His ability as a diagnostician was of high order, and his skill as an operator was superb. He was self-reliant, deliberate, and resourceful. His knowledge of anatomy was accurate, and his perception through every stage of the operative procedure was alert and his judgment trustworthy. He was gifted in his ability to recognize and adopt the best of the changing methods which

were presented in the development of modern surgical technique, and was able to bring the simplicity of perfection out of complicated details.

Personally, Dr. Cartledge was a man of genial and attractive manners, and won friends on all sides. He was an exceptionally handsome man, always approachable, and attractive in manner. He was fond of outdoor life, and availed himself of every opportunity which his busy life would permit for outdoor recreation. His death was sudden. He had retired after a busy day, and death came within an hour. His wife preceded him to the grave one year before, and he left an only child, Miss Anna Cartledge, a charming and attractive school-girl. He enjoyed the friendship, esteem, and good-will of the entire medical profession, and was one of the most popular and respected citizens of the community. His funeral was largely attended, and the comments of the public and professional press and the resolutions of the various societies, in which he was a striking figure, attest the profound loss which the public and the profession sustained in his death.

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